# Chemical Age

FIRST U.K. PROJECT CONSORTIUM (page 9)

VOL. 83 No. 2112

2 January 1960

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY

For the transport of corrosive and sensitive liquids—

**VALETHENE CONTAINERS**

Valethene containers combine the high chemical resistance and inert properties of polyethylene with the strength, robustness and handling characteristics of universally accepted standard steel drums. Bulk transit of corrosive and sensitive liquids can now be made more conveniently, safely and economically.

The semi-rigid moulded polyethylene inner container also protects your materials from contamination and is manufactured by a new patented process. These containers are already widely used in the United States.

*Manufactured entirely and solely by:*

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WORKS: ELLESMERE PORT, RENFREW & CRAYFORD ASSOCIATED COMPANIES IN GT. BRITAIN & ABROAD

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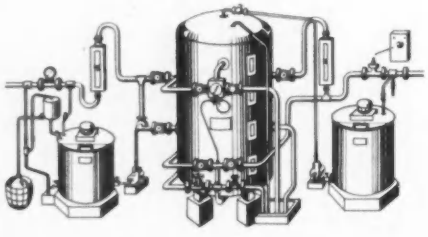
Why not ask NECKAR sir?

***Yes, let experts tackle the 'pure water' problem.***

Ion exchange is the most up-to-date method of producing pure water for all requirements, and it does this at a fraction of the cost of distillation.



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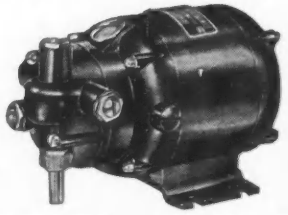

SERIES WOUND GEARED MOTOR—Type 'K'

| R.P.M. | TORQUE | R.P.M. | TORQUE |
|---|---|---|---|
| 600 | 10 oz. in. | 37.5 | 4 lb. in. |
| 300 | 16 oz. in. | 25 | 4 lb. in. |
| 150 | 24 oz. in. | 18.8 | 4 lb. in. |
| 100 | 32 oz. in. | 12.5 | 4 lb. in. |
| 75 | 36 oz. in. | 9.4 | 4 lb. in. |
| 50 | 3 lb. in. | 6.25 | 4 lb. in. |

SHADED-POLE INDUCTION GEARED MOTOR—Type 'FA'

| R.P.M. | TORQUE | R.P.M. | TORQUE |
|---|---|---|---|
| 216 | 4 oz. in. | 13.5 | 24 oz. in. |
| 108 | 7 oz. in. | 9 | 30 oz. in. |
| 54 | 10 oz. in. | 6.7 | 35 oz. in. |
| 36 | 12 oz. in. | 4.5 | 44 oz. in. |
| 27 | 15 oz. in. | 3.35 | 3 lb. in. |
| 18 | 20 oz. in. | 2.25 | 4 lb. in. |

VARIABLE SPEED GEARED MOTOR—Type 'KQ'

| R.P.M. | TORQUE | R.P.M. | TORQUE |
|---|---|---|---|
| 200-600 | 9 oz. in. | 12-37.5 | 4 lb. in. |
| 100-300 | 16 oz. in. | 8-22 | 4 lb. in. |
| 50-150 | 20 oz. in. | 6-16.5 | 4 lb. in. |
| 32-100 | 32 oz. in. | 4-11 | 4 lb. in. |
| 25- 75 | 40 oz. in. | 3- 8.25 | 4 lb. in. |
| 16- 50 | 48 oz. in. | 2- 5.5 | 4 lb. in. |

CAPACITOR INDUCTION GEARED MOTOR—Type 'N'

| R.P.M. | TORQUE | R.P.M. | TORQUE |
|---|---|---|---|
| 456 | 8 oz. in. | 28.5 | 3 lb. in. |
| 228 | 13 oz. in. | 19 | 4 lb. in. |
| 114 | 21 oz. in. | 14.2 | 4 lb. in. |
| 76 | 26 oz. in. | 9.5 | 4 lb. in. |
| 57 | 32 oz. in. | 7.1 | 4 lb. in. |
| 38 | 44 oz. in. | 4.75 | 4 lb. in. |

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# SHELL CHEMICALS REDUCE PRICES AGAIN!

## Propylene oxide and polyethylene glycols prices reduced effective 1st January 1960

**Following the price reductions announced in December 1959, Shell Chemical Company now reduce the prices of Propylene Oxide and Polyethylene Glycols.**

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*In association with Petrochemicals Limited and Styrene Products Limited*

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*MIDLAND* Warwick Chambers, 14-20, Corporation Street, Birmingham, 2. Tel: Midland 6954
*NORTHERN* 144-146, Deansgate, Manchester, 3. Tel: Deansgate 2411
*SCOTTISH* Royal London House, 48-54, West Nile Street, Glasgow, C.1. Tel: City 3391
*IRISH* 16-20, Rosemary Street, Belfast, Northern Ireland. Tel: Belfast 26094
33-34, Westmoreland Street, Dublin, Republic of Ireland. Tel: Dublin 72114

**YOU CAN BE SURE OF SHELL CHEMICALS** GCA/10

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BRITISH CELANESE LIMITED
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Telephone: 88771

'Celanese' chemicals

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Wanted, SUPERINTENDING MECHANICAL ENGINEER for the maintenance and erection of Dyestuff Plant, vicinity Bombay, India. Employers prepared to enter into three-year agreement; attractive salary free of all taxes. Terms of employment may be extended by mutual agreement. Free residential accommodation will be provided at factory site. At least 5 years' practical experience on a chemical plant necessary. Write, fully stating qualifications, **Box No. 3688, Chemical Age.**

*SITUATIONS VACANT: continued*

Wanted, RESEARCH CHEMIST for control of Research Laboratory of Dyestuff Plant in the vicinity of Bombay, India, manufacturing all types of Naphthols, Fast Bases and Optical Bleaching Agents at present. Expansion programme of manufacture of Acid and Basic Dyes and vital intermediates like Phthalic Anyhdride and Beta Naphthol on hand. At least 5 years' practical experience in similar post necessary. Employers prepared to enter into three-year agreement; attractive salary free of all taxes. Period of employment may be extended by mutual agreement. Free residential accommodation provided at factory site. Write, fully stating qualifications, **Box No. 3689, Chemical Age.**

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*Manager* R. C. BENNETT
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# NITROGEN'S BRIGHT OUTLOOK

WORLD production and consumption of nitrogen continued to increase, with 1958/59 production up by 9½% over 1957-58 and consumption up 7%. For Europe and Egypt alone, the increase was greater—production being up by nearly 12% and consumption by 8%. So states the latest Aikman report prepared by Aikman (London) Ltd. and published by agreement with British Sulphur Corporation Ltd. in the Corporation's publication *Nitrogen* (December 1959. No. 4.).

An advantage of the agreement with British Sulphur Corporation has been that Aikman's have had access to the statistical department of the corporation. The company has therefore revised some figures of production and consumption for the years 1955/56 to 1957/58, although in most instances the amendments are small. Figures for 1958/59 have been brought up to date and Aikman's estimates for 1959/60 have now been included. Thus it is estimated that during 1959/60 production and consumption of nitrogen will increase by 6½% and 5% respectively and that therefore the excess of production over consumption will be 5½%.

Satisfactory from the producer's point of view is the present stock position. The prolonged steel strike in the U.S. is creating short supply in that country and has enabled Canadian producers to increase their sales there. Determination to move nitrogen stocks at any price has had its effect in Europe and large quantities have been exported so reducing stocks to a minimum. In spite of recent sales to Korea, India and other countries, the stock position in Japan is still causing concern and some rationalisation or curtailment of production is expected. It will be recalled that the Aikman half-yearly report issued in June last year, revealed that nitrogen prices were then at a low level and that although a further fall might be expected in the near future, they forsaw the bottom being reached and a possible rebound. Prices have since gone lower, as predicted, but what Aikman's did not forsee was the extent to which prices would fall. In the present report, however, Aikman's opine that the market has turned and that from now on no further lowering of prices will occur—in fact, more probably the reverse. A possibly disquieting note is that during the last six months producers, in an attempt to move their stocks at all costs, have done so at ever reducing prices, which Aikman consider was unnecessary.

What of the world situation in nitrogen? Aikman note that, in Spain, as a result of that country's entry into O.E.E.C. as a full member, imports have been liberalised, so that importers are now free to buy from where they like and at a price at which they can negotiate. Since liberalisation an import duty has been imposed by the Spanish authorities in order to protect their national production, and because this is based on the value of gold it is not easy to calculate the exact import duty. At today's value, it works out at about 15%. However, should the prices of exporting countries to Spain further be reduced, Aikman envisage that the duty would be increased in order to maintain protection of the Spanish producers. Hence it is for this reason that Aikman feel it is pointless for exporting countries to make any further reductions. In April 1959 European producers sold ammonium sulphate at $37 a ton to Spain, and since then sales have been effected at

$35. It is believed, also, that Canadian producers sold two cargoes at about $31.75 F.O.B. Freight rates have risen considerably and Aikman point out that whoever took the freight risk must stand to make a loss.

In general, as has been noted from *Freight Review* reports in CHEMICAL AGE, freight rates have made a good recovery during the last three months. If this trend continues however, Aikman consider that Japan will be in a favourable position to sell in the Far East, while the U.S. will be at a disadvantage for all their exports except in the Caribbean, Central and South America.

Of sale prices for nitrogen in the Far East, the lowest offer was from Shell Chemical Co. for Korea, of 1,500 tons of urea at $73.77 F.O.B. or $88.77 C. and F. U.S. liner. Japan offered 50,000 tons of urea at $80.70 F.O.B., $89.20 C. and F. U.S. liner or $83.70 non-U.S. liner. Shell, report Aikman, sold their 1,500 tons on the cost and freight basis and the balance of 48,377 tons was awarded to Japan. Of this tonnage, approximately 30,000 tons was awarded at $89.20 C. and F. U.S. liner and 18,000 tons at $80.70 F.O.B. Japanese port. Japan was also awarded 2,000 tons of ammonium nitrate ($57.95 F.O.B., Japanese port).

Japan was also successful in India, selling 31,300 tons of urea at £31 3s. 7d./ton and 108,000 tons of ammonia sulphate at £15 2s. 9d. C. and F. landed (in 100 kilo jute bags). European producers sold some urea at £30 13s., ammonium sulphate nitrate at £19 11s. 1d. and calcium ammonium nitrate at £14 9s. 6d. but the low Japanese price for sulphate of ammonia set the pace for general price reductions and the Chinese therefore forced European suppliers to reduce their price to £11 17s. 9d. for ammonium sulphate and £11 3s. 9d. for calcium ammonium nitrate F.O.B. in bags, a drop of £1 15s. from that prevailing six months ago.

Pakistan had tender offers for ammonium sulphate, from producers in Europe, including East Germany, Japan and Australia. Some 20,000 tons were bought eventually from Italy, half at $44.40 and half at $44.50 and a further 10,000 tons from Austria at $43.20. (C. and F. liner terms.) Lack of foreign currency in Egypt has caused tenders to be withdrawn, but it is understood some European suppliers have concluded sales for calcium ammonium nitrate at $39.20 (C. and F., Alexandria).

The Aikman report gives, as usual, details for individual countries and their revised estimates of production and consumption in the world (excluding U.S.S.R.) from 1955/56 to 1959/60, in terms of thousands of tons of pure nitrogen are as follows:

| | Production | | Consumption | |
|---|---|---|---|---|
| | Agriculture | Industry | Agriculture | Industry |
| 1955/56 | 6,823 | 1,245 | 6,307 | 1,245 |
| 1956/57 | 7,278 | 1,370 | 6,977 | 1,370 |
| 1957/58 | 7,983 | 1,510 | 7,773 | 1,510 |
| 1958/59 | 8,768 | 1,630 | 8,327 | 1,630 |
| 1959/60 | 9,342 | 1,715 | 8,744 | 1,715 |

Aikman estimates of actual production in the U.S.S.R. in thousands of metric tons of pure nitrogen to be: 1955/56, 627; 1956/57, 710; 1957/58, 750; and 1958/59, 800. Consumption in the U.S.S.R. is not known but it is believed that consumption has been greater than these figures show.

## JAPANESE UREA PROCESS

READY to licence their new total recycle urea process that is already on stream at Chiha, Japan, are Tojo Koasu. This company's plant has a capacity of 66,000 metric tons a year.

Through their U.S. agents, Mitsui and Co., the Japanese company has learned that several U.S. companies are interested in their process despite the strong hold Montecatini have had with their urea process in the U.S.—three plants are using the Montecatini urea process and a fourth is under construction. Also proving of interest is that of Chemical Construction Co. while Foster Wheeler Corporation who offer Pechiney's urea process, have joined with W. R. Grace and Co. offering engineering improvements the latter have developed.

In Toyo Koatsu's favour is the fact that raw material and utility consumption figures for the Japanese process compare favourably with those of competing processes. According to the Japanese concern, one ton of urea requires 0.75 tons $CO_2$, 0.59 tons $NH_3$, 3,200 lb. of steam, 155 kWh electrical power and 27,000 gall. cooling water. Savings are also claimed in capital investment.

## U.K. CONTRACTING PROBLEMS

'CONTRACTUS', author of the first of a new series of articles on the chemical plant and contracting fields in p. 13, is the pen-name of a man with many years of experience in this highly competitive industry. He will combine his wide knowledge of his subject with a lively pen in analysing various facets of chemical contracting and the plant and equipment industry.

His first article—"Is there room for them all?"—should arouse much interest for with all the big chemical companies doing so much of their own engineering design and construction, the number of major projects left for the contractors is very meagre.

Another trend that aggravates the position of the chemical contractor, but which 'Contractus' does not mention in this article, is the growing practice in the U.S. for chemical firms to award projects to general contracting firms with no chemical industry experience. This has happened in this country with George Wimpey building plants at Fawley and Grangemouth for Union Carbide and their recent appointment as contractors for a polyolefin plant (believed to be polythene-polypropylene) in Antwerp. Wimpey have no process design staff and are merely concerned with following flowsheets provided, and procurement, presumably to Union Carbide's own directions.

It is hardly likely that Wimpey will employ their chemical engineers or chemists, since they would then lose their value to the clients who obviously do not wish to make use of a firm with specialised chemical construction techniques in order to preserve utmost secrecy concerning their process know-how.

The most effective way of solving the problem of making full use of the highly-skilled staffs of chemical engineering concerns lies along the lines envisaged by Mr. H. W. Fender, at the annual dinner of the British Chemical Plant Manufacturers' Association. At the recent annual dinner (see C.A., 14 November, p. 679) he suggested the formation of sound technological consortia of chemical producers and plant firms.

This week we are able to announce exclusively (see p. 9) the first formation of such a consortium. This involves Constructors John Brown Ltd., and three chemical manufacturers, who have formed a new company to handle contracts with the Soviet Union. C.J.B. will be responsible for construction and procurement while the chemical companies will handle process know-how.

That there must be other such consortia is obvious, in fact at least one other is now being actively planned, although some chemical and allied firms, notably Courtaulds will probably want to handle overseas projects on their own, providing both process and engineering design and construction themselves. It is to be hoped, however, that chemical producers will see the wisdom of making full use of the highly skilled resources readily available in the contracting and plant industry of this country.

## Ashburton Abandon Glynllifon Scheme

THE Ashburton Chemical Co., a subsidiary of the Geigy Group, abandoned their development schemes at Glynllifon 'with great regret and as a result of very technical and commercial investigations covering the main industrial centres of Europe and the U.S.' This was stated by Mr. R. W. Williams, chairman of the Parliamentary Committee of Caernarvonshire County Council, who referred to the Glynllifon Property Co. Ltd.—a directly-owned subsidiary of Geigy—whose intention had been to develop some 30 acres of the 140 acres that had been bought as an industrial estate.

Mr. Williams explained that he and the five members had been pledged to secrecy regarding the technical developments and the change-about in world trade which had caused the abandonment of the two projects.

## Pollucite Ore Deposit Developed in Rhodesia

TESTS indicate that a deposit of pollucite ore developed at Bikita, Southern Rhodesia, is one of the world's largest and that it offers a reliable supply of low cost ore. This is stated by Borax and Chemicals Ltd., selling agents in the U.K., sterling area and Europe for Bikita Minerals (Private) Ltd.

Pollucite, an aluminium-caesium silicate, is a source of caesium for applications in the glass and ceramic industries, in welding rod fluxes and other uses where silica and caesium can be employed together. The pollucite in the Bikita deposit has an average content of 24.4% caesium oxide.

In the past caesium was available only in small quantities until American Potash and Chemical Corporation, parent company of Borax and Chemicals Ltd., started production of caesium metal and compounds at San Antonio, Texas, utilising Bikita ore. Bikita's pollucite reserves are part of its large lithium-beryllium deposit located near Fort Victoria, Southern Rhodesia. Bikita Minerals are owned principally by Selection Trust Ltd. (who act as technical managers of the company), American Potash and Chemical Corporation and American Metals Climax, Inc.

A dramatic potential use for caesium is said to be in ion-propulsion engines for space travel. This type of engine, which is now under development, produces small thrust but becomes practical in outer space after a vehicle's initial speed has been provided by rockets or other power source.

## Anti-Dumping Duty Sought on Sodium Chlorate

The Board of Trade are considering an application for the imposition, under the Customs Duties (Dumping and Subsidies) Act, 1957, of an anti-dumping duty on sodium chlorate imported from East Germany. Representations by interested parties should be addressed in writing not later than 12 January 1960 to the B.o.T., Tariff Division, Horse Guards Avenue, London S.W.1.

*Project News*

# First Consortium Combines Chemical and Contracting Firms

FIRST of the big consortia of chemical producers and contracting companies, envisaged recently by Mr. H. W. Fender, president of the British Chemical Plant Manufacturers' Association, to handle major overseas projects, has been formed. It involves Constructors John Brown Ltd. with Boots Pure Drug Co. Ltd., Murgatroyd's Salt and Chemical Co. Ltd. and Whiffen and Sons Ltd. C.J.B., who have quotes in for 10 Soviet projects, will provide the construction know-how and the three chemical companies the process know-how. Other consortia involving contracting and chemical producing firms are being planned.

● FOLLOWING the 'Distillates' item (CHEMICAL AGE, 28 November, p. 768), it now appears that I.C.I. will be first on stream with their polypropylene plant. If current construction work continues to schedule, the plant will be completed at Wilton by C.J.B. by mid-1960. Shell Chemical, with their polythene-polypropylene plant now under way at Carrington, with Matthew Hall as contractors, are expected on stream in 1961.

● A THIRD refinery project for Turkey is under consideration by the Turkish Government (see 'Distillates,' 5 December, p. 810). Calls for tenders have gone out in respect of two oil refineries, in Panama and Cocono, Chile.

● FIRST U.K. installation by British Petroleum for the production of volatile special products in the naphthalene-gasolene range, is being installed at the B.P. Isle of Grain refinery. The plant, with an annual solvents capacity of 30,000 tons, is being constructed by three main contractors, C.J.B., Motherwell Bridge and Engineering Co. Ltd., 82 Victoria Street, London S.W.1, and George Wimpey and Co. Ltd., 27 Hammersmith Grove, London W.6.

● NEW contracts in hand by C.J.B. include installation of Kittel towers at Heysham, pipework at Immingham, installation of acid-washing plant at the Isle of Grain, the laying of 50 miles of gas pipeline at Lincoln, a control equipment contract at Runcorn, site wrapping and laying of steel gas pipeline at St. Mary Cray and the installation of control equipment at Swansea.

● NEWS of Esso's investigations of the possibility of a pipeline for petroleum products between their Fawley refinery and London was published in the national press last week. These investigations have been in hand for some time and are understood to involve the purchase of 50 acres south of London Airport for a terminal point.

● SUBCONTRACTORS in an American deal are William Boby and Co. Ltd., water-treatment engineers of Rickmansworth, Herts. Boby's are to provide for C. A. Parsons and Co. demineralisation plants for the supply of cooling water for the stator of the 550 MW turbo-alternator which Parsons are making for the T.V.A.

# Shell–I.C.I. £A10 million Petrochemical Agreement in Australia

AGREEMENT for construction of new and expanded petrochemical plants in New South Wales has been reached between Shell Chemical (Australia) Proprietary and Imperial Chemical Industries of Australia and New Zealand (I.C.I.A.N.Z.). In a joint statement the companies state that the agreement is of great importance to the petrochemical industry in Australia.

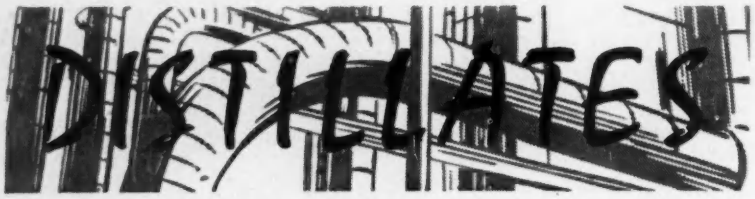
Shell Chemical are to erect an ethylene manufacturing and purification plant at Clyde, New South Wales, in association with Shell's refinery there. The ethylene produced will be piped to I.C.I.A.N.Z. at Botany, N.S.W. where its immediate use would be in the manufacture of polythene.

To accommodate the new programme the plant at Botany, already extended several times, is being further enlarged. Total investment represented by I.C.I.A.N.Z.'s extended facilities at Botany and Shell's new ethylene plant at Clyde would be over £A10 million.

Adequate supplies of ethylene will be available to meet I.C.I.A.N.Z. and Shell requirements for many years, it is reported. Construction at Clyde is expected to start this year and to be completed within two years. A feature of the agreement is that a portion of the polythene made by I.C.I.A.N.Z. will be marketed by Shell Chemical (Australia). This development, although new to Shell in Australia, is in line with current marketing activities of Shell Chemical's overseas associates.

## Exhibition to Depict Gas in Industry

The second 'Gas at work in industry' exhibition, organised by four of the Area Gas Boards will be staged in the Royal Horticultural Hall, Westminster, from 1 to 12 March. Working plants will be on view, together with models, films, etc., describing how atomic energy, radar, television and numerous other industries utilise gas, and there will be demonstrations of metal melting, tinning, diecasting and special purpose plant for the clean heat treatment of metals. Further details may be obtained from the Gas Council, 1 Grosvenor Place, London S.W.1.




★ REPORTS in a recent issue of the *Yorkshire Post* in which the death of pigeons in York was alleged to have been due to mercury poisoning have led Plant Protection Ltd., Fernhurst, who have been associated with organo-mercury seed dressings for the past 30 years, to write to the editor. Mr. H. C. Mellor, the company's technical services manager, pointed out that during that time the company had never experienced any proven cases of bird or wild life deaths due to the eating of seed treated with their preparations.

He described extensive feed tests which have shown that organo-mercury treated grain was non-poisonous to birds. He also quotes independent feeding tests with both organo-mercury and organo-mercury-BHC seed dressings during which birds were fed for six weeks with a total of 15 oz. each of grain dressed with Ceresan or Mergamma. The research workers concerned, Carnanaghan and Blaxland, reported "grain dressing containing organo-mercurials and gamma-BHC were found to be non-toxic both to pigeons and pheasants".

★ I LEARN that scientists at the Westinghouse research laboratories in the U.S. have taken a major step towards the fast, continuous and completely automatic production of transistors and related semiconductor devices. They have constructed long ribbons of semiconductor devices by forming them along the surface of long, thin crystals of germanium ¼ in. wide and a few thousands of an inch thick.

This technique appears to be feasible for the automatic production of transistors and other solid state devices directly by machine. Westinghouse workers have also discovered a "revolutionary new method for growing germanium", a technique which grows the germanium as thin, flat, continuous strips or dendrites—the exact form in which it can be used directly in finished semi-conductor devices.

Conventional ingots of semiconductor materials, grown in thick round shapes, which must go through tedious and complicated manufacturing procedures, are not thought likely to yield the near-perfect devices sought in the new concept of molecular electronics.

I am told that germanium dendrites have only one preferred growth-direction, which causes them to form rapidly into strips about ¼ in. wide; there is no known limit to their length.

★ THAT the Russians know something that other people don't know, in the field of rocket propulsion fuels at least, is of course common knowledge, though it seems doubtful if a subscription to the Russian Patents Gazette would add much to Western know-how on reaching for the moon. Even so, news that the Gazette is available (the Chemistry and Chemical Engineering section, published monthly, costs £20 per annum from the Technical Information Co., at Chancery House, Chancery Lane, London, W.C.2.) should be of more than incidental interest.

Concise abstracts are arranged "under convenient subject headings" which probably facilitate retrospective researches through records of patents; and copies of original texts (suitably translated!) are available.

While it is a safe assumption that the bulk of the technical material both sides of the so-called Iron Curtain have recently begun to feed through their respective clearing houses, such information is somewhat dated. It is, however, at least a welcome indication of the easing of basic attitudes which could lead to better things in the future.

★ WORLD-WIDE operations of the Unilever Ltd. and Unilever N.V. groups are analysed in the current edition of *Progress*, the Unilever magazine. I was particularly interested in the breakdown given of the group's 1958 turnover: margarine and edible fats, £272 million; washing products, £291 million; toilet preparations, £35 million; other foods, £190 million; oils and fats (mostly sales within Unilever), £427 million; animal feedingstuffs, £136 million; produce and merchandise (mainly United Africa Co.), £279 million. Other operations accounted for £98 million.

Special maps show the extent of the Unilever empire. The U.K. has 57 factories for the production of soaps/detergents, refined glycerine, oilseed crushing and extracting, oil refining, oil hardening, chemicals and allied products, etc. The only other country with chemical plants is France. Glycerine is refined in Austria, South Africa, Australia, New Zealand, Canada, the U.S., Argentina, Brazil, India, Pakistan, Indonesia.

It is not always realised that apart from Sunlight soap, Lux and Stork margarine, Unilever operations include Wall's ice cream and sausages, Batchelor's peas, Birdseye frozen foods, Gibbs' S.R. toothpaste, John West Middle-cut salmon and the MacFisheries chain.

★ THAT genial New Zealander Dr. G. L. Hogben, who has now taken under his care the developemnt of agricultural work study, for I.C.I.'s Central Agricultural Control has made it an initial task to undertake a personal survey into the influence of modern educational and publicity media on the lives of both town and country dwellers.

Speaking at a private luncheon in London he voiced a conviction that, while television is now a factor of far-reaching effect in rural as well as urban areas, it is still the printed word upon which the masses place final reliance. Television frequently proves the means of claiming initial attention, but where there is any likelihood of influencing the life or livelihood of individuals, there is still an insistence on closer study through the printed word as a means of reaching a final decision.

Dr. Hogben made his observation the occasion for a plea for greater co-operation between the press generally, and the specialist press in particular, and television. As a result of TV impact the specialist press now faced a new duty in offering detailed explanation upon themes raised by television. This was an essential follow-up to specialist subjects spotlighted through the television cameras and thus widely yet briefly publicised.

The Benn Group of trade journals whose chairman, Mr. Glanvill Benn, heads the Advertising Advisory Committee of the Independent Television Authority, welcomes this impartial and important verdict. The Benn Group has long maintained that the activities of television and the specialist press must be complementary. There can be no question of rivalry, since this is solely a question of different approaches to a common objective. Thus can nothing but good come from closer co-operation.

★ FIRST blast furnace at the Durgapur Steelworks in West Bengal was commissioned by Dr. Prasad, President of India on 29 December. The Durgapur project is the largest single export order ever undertaken by Britain; it is worth some £105 million, of which the f.o.b. U.K. production accounts for more than £50 million, with Indian work valued at about £50 million.

Stage 2 which includes a second coke oven battery, benzol rectification plant and an oxygen plant is scheduled for completion by 30 April, 1960.

Rated capacity of the whole plant is 1 million ingot tons a year with 360,000 tons a year of pig iron and some 800,000 tons of finished and semi-finished products. Output per hour of coke oven gas, with a calorific value of 530 B.T.U./cu. ft., is 2.36 million cu. ft., with outputs of blast furnace gas (calorific value 95 B.T.U./cu. ft.) rated at 18 million cu. ft. per hour.

Daily production of coke oven by-products is placed at bagged sulphate, 57 tons; crude tar, 156 tons; benzene, 6,240 gall.; toluene, 884 gall.; xylene, 182 gall.; solvent naphtha, 146 gall. Member of the 13-firm British consortium responsible for coke ovens and by-products plant, power plant, steam and gas distribution is Simon-Carves Ltd.

*Alembic*

*Exclusive 'Chemical Age' Interview*

# West German Chemicals Chief Urges Six-Seven Trade Links

ON 1 January, Dr. Rudolf Schmidt, director of Schering AG., Berlin, took over the presidency of the leading West German chemical association, Verband der Chemischen Industrie. Recently CHEMICAL AGE went to Frankfurt, headquarters of the association, to interview Dr. Schmidt to learn his views and intentions in filling the position in this important chemical-producing country. It was his first interview with any trade journal on the eve of his new appointment.

Dr. Schmidt is a man of liberal views. Convinced of the certain broad expansion of the chemical industry in the future, he would like to see a combination of the two existing trade blocs, Outer Seven and Common Market, into one free trade area and, further than this, an eventual free world trade when such a programme is possible. That this wish for a really united Western Europe is not based simply on thoughts of national advantage is proved by the fact that Dr. Schmidt is not unduly worried about the effects of the Outer Seven's formation on the German chemical industry, although he foresees that it will become harder for Federal Germany to expand its chemical exports to Outer Seven customers—who at present buy more from Germany than do neighbour Common Market members. His very real and sincere hope for commercial co-operation within Western Europe is backed by a wish for co-operation on other planes within the industry as between country and country.

## Iron Curtain Countries

The future president's attitude towards the Iron Curtain countries is more reserved. No western country, he believes, should trade so much with a Communist-bloc country as to make it dependent on such an export-import partner. At present he professes not to be nervous of the production levels of the Communist countries, though he by no means underestimates their potential and the power which they will pack into development programmes. Speaking specifically of the East German republic, he said that chemical production there was as yet having barely any effect on Federal Germany and the time for real worry was not yet here. The expansion which would take place within the East German chemical industry, however, would be very considerable.

Speaking generally of the chemical markets of the future, Dr. Schmidt told CHEMICAL AGE that he believed growing demand would balance with increasing capacities and inter-country competition. There is room, he thinks, for both the U.K. and Federal Germany in the chemical world, as both have a big job to do in the satisfying of future demand. Supplies from the Eastern half of Europe would obviously become an ever-more important problem, with their ability to concentrate on raw materials and industrial goods at the expense of consumer goods.

The main branches of expansion in the future were without doubt plastics, synthetic fibres and allied products, and in Germany as elsewhere the petrochemical sector would expand rapidly. Coal chemicals—in Germany at least—did not have exactly the brightest of futures, and their ability to keep up would depend on the economic structure of coal production and marketing, as against pipeline oil, natural gas and its other competitors. Coal chemicals would not die, but the advantages of petrochemicals seemed considerable. In the question of synthetic fertiliser sales, the peak was definitely passed, although the need for a greater per-head consumption of these would keep this branch going.

What will be the tasks which Dr. Schmidt will devote himself to most in his new post, asked CHEMICAL AGE. The furtherance of Western commercial and other co-operation, he answered, as well as a strong backing of the attempts to cut the time needed for chemical study in West Germany. A student can now spend nine years in study, he explained, and he belonged to those who felt that this could easily be cut to six. Nine years was far too long.

As main problems to be faced by Europe's chemical industry he gave rationalisation of production programmes and, again, the forming of stronger international contracts.

## Favours Large Concerns

Finally, CHEMICAL AGE put him the question as to whether he disapproved of the tendency to large chemical companies in his own country. "Certainly not," was his answer, "big companies can do many things which smaller units are unable to accomplish—and a failure of a small-company industry often brings calls for nationalisation. The development of big concerns is a natural and sound movement, and no moves should be made to stop it."

# *Midland Tar to Reorganise Pot Still Area at Nechells Plant*

REORGANISATION of Nechells Plant by Midland Tar Distillers Ltd., carried out in the past two years, is described in an article in the Christmas issue of the *M.T.D. Magazine* by Mr. W. E. Aylwin, director in charge of works operations. The company's old pot still area remains to be reorganised. Several of the pot stills will be demolished, but enough will be left to enable the production of pelleted pitch and coumarone resin to continue. When this work is complete, the whole of the area will have been cleaned up.

A Proabd crude tar distillation unit with a capacity of 300 tons/day, was put through its test runs at the end of April, when fractionation capabilities were proved to be good. The unit is handled by one operator per shift with a pumpman who also blends P/C mixture and refined tar. The unit distills crude tar either to M.S. pitch or to base; provision has been made for the injection of a limited quantity of light oil so that it can act as a partial standby to the light oil distillation plant at Oldbury.

Distillate receivers and facilities have also been installed for blending creosotes with the pitch or base for the production of P/C mixture, and refined tar has been increased to cope with the higher throughput.

Most of the reorganisation programme was designed and installed by the company's own engineering department aided by labour supplied by Matthew Hall and Houston. An induced draught water cooling frame was provided by Film Cooling Towers Ltd. to handle the considerably increased demand for cooling water.

# Patent Office Mission To Moscow

OWNERS of worth-while patents who contemplate trading with the Russians may well have a good deal to gain if they patent their inventions in the Soviet Union, states a report from the Comptroller-General of Patents, apropos of the recent visit to Russia of the U.K. Patent Office delegation.

Discussions, which are said to have taken place in an atmosphere of cordiality and goodwill, do not appear to have been fruitful to any specific extent, although a feeling-out of the Soviet attitude to foreign inventions and their protection within Russia was successfully carried through by the delegation, which was led by Mr. Gordon Grant, the Comptroller-General, and included Mr. H. R. Mathys, a director of Courtaulds Ltd.

The delegation propose to issue a more detailed report.

### Courtaulds-in-Transport to be Exhibited

An exhibition 'Courtaulds in Transport' is to be staged at Celanese House, Hanover Square, London W.1, from 21 to 28 January, in which the products of the group, ranging from textiles and tyre-cord to chemicals and paints will be shown. A major exhibit will be a 41-seater coach completely fitted out with items manufactured by Courtaulds.

# S.A.C. COMMITTEE TO INVESTIGATE TOXIC RESIDUES IN FOOD

CONTINUED progress in the activities of the Analytical Methods Committee of the Society for Analytical Chemistry in 1958 is reported. Notable event that year was the publication of 'Recommended Methods for the Analysis of Trade Effluents.'

The fourth report gives an account of the progress of work during the 12 months ending 25 February 1959. The Vitamin E panel has now completed its work and its method for the determination of tocopherols in oils, foods and feeding stuffs. Research work at Harwell by the society's research scholar, Mr. T. T. Gorsuch, on the use of radiochemical techniques to investigate the recovery of trace elements from organic materials was completed.

Two panels of the joint committee with the Pharmaceutical Society, which are investigating methods of assay of crude drugs, are preparing reports. One of these on methods for determining the capsaicin content of capsicum, B.P.C. and some of its products has been approved; the other report, on a method for determining the rotenone content of ground lonchocarpus root, is in preparation. Being confirmed are investigations of methods for: direct micro-determination of oxygen in organic matter (Unterzaucher method); trace elements in fertilisers and feeding stuffs; essential oils; anthraquinone drugs and digitalis (chemical method).

## Work of Sub-committee

A new sub-committee has been appointed to investigate methods for determining semimicro amounts of chlorine in organic compounds, particularly pesticide formulations. This work which has already reached an advanced stage, was undertaken at the request of the Association of British Manufacturers of Agricultural Chemicals. Another subcommittee started work on determination of pesticides in foods. Investigations into possible methods for the biological determination of the presence or absence of toxic residues in foods will begin with a short survey of information available in British and Continental laboratories. Mr. P. H. Needham, Rothamsted Experimental Station is to carry out the preliminary work.

In regard to collaborative testing of proposed methods of analysis of pesticides residues in feedstuffs, two methods are at present under test, one for DDT and one for BHC.

A short-term investigation under the direction of Dr. H. M. N. H. Irving at Oxford is aimed at devising a method for determining traces of silver in the presence of organic matter. A report is now being prepared.

Work on the additives in Animal Feeding Stuffs Subcommittee has been divided among four panels. An antibiotics panel is examining chemical and microbiological methods for penicillin, aureomycin and oxytetracycline (terramycin). A prophylactics panel is investigating chemical methods for the following prophylactics: coccidiostats and anti-blackhead drugs, sulphaquinoxaline, sulphadimidine, sulphaquanidine, nitrofurazone, nitrophenide, nitrocarbazin, aminonitrothiazole, acinitrazole and furazolidine. Chemical methods for vitamin A and for $\beta$-carotene are being examined by the vitamins (fat-soluble) panel and microbiological methods for riboflavin, vitamins $B_{12}$ (cyanocobalamins and derivatives), nicotine acid (and derivatives), pantothenic acid, vitamin B and choline, by the vitamins (water-soluble) panel.

The Trace Elements in Fertilisers and Feeding Stuffs subcommittee, had as its terms of reference the devising of appropriate methods of analysis to be recommended for inclusion in the Regulations under the Fertilisers and Feeding Stuffs Act 1926 for the determination of Br, Co, Cu, F, I, Fe, Mg, Mn, Mb, Se and Zn which can be expected to be present in fertilisers and feeding stuffs. As a result of a number of collaborative tests during the year, methods for the end-determination of 10 of the 11 elements mentioned above have been tentatively adopted. All of these are based on published methods but modifications have been found necessary to cater for the various types of materials usually encountered in practice. Methods for magnesium were still under test and suitable methods for preliminary treatment of the sample have yet to be devised for some of the elements.

In addition to the 11 elements included in the terms of reference, it was decided to prepare methods for chromium and nickel, since these metals are likely to be present in sewage sludges used as fertilisers: some methods have been tentatively agreed.

# *Rapid Determination of Fluorine in Semi-micro Amounts*

MODIFIED nuclear magnetic resonance has enabled Advanced Research Project Agency to determine rapidly fluorine in semi-micro quantities. Difficulties in determining fluorine dry routine instrumental analysis became critical in the fluorine phase of the high energy propellant programme sponsored by A.R.P.A. Hence one of the companies involved in the A.R.P.A. programme, Esso Research and Engineering, U.S.—the other companies are American Cyanamid, Dow, Minnesota Mining and Manufacturing—investigated the value of nuclear magnetic resonance (NMR) as a means of speeding up analysis. With Schlumberg Well Surveying's instruments division, Esso's NMR analyser was modified to detect fluorine in small samples.

Schlumberger Model 106 was developed having a new device which will detect and measure both fluorine and hydrogen separately by a simple frequency change—6 megacycles for fluorine; 7 for hydrogen. Fluorine can be determined non-destructively, it is stated, in 30 seconds using a sample of 0.20 ml. (about four drops), and an accuracy within 1% is claimed.

Basically Model 106 is a wide-line low-resolution instrument. With fluorine, spectral details, such as chemical shift are about ten times larger than those for hydrogen (protons). The spectral details can be observed.

The NMR principle is unchanged: Every fluorine nucleus spinning about its axis has a charge. When placed in a magnetic field, the nucleus begins to precess. Energy at the resonant frequency is absorbed from a coil around the sample. This is measured as a derivative of energy absorption and recorded on a strip chart. The curve produced can be interpreted manually, or the results can be compiled by an integrator which gives a direct measure of fluorine content.

While NMR cannot give the complete answer to the effectiveness at possible performance of a fluorine-based propellant, it can provide much information about the nature and bonding of the compound. Mixtures such as fluorobenzene and benzotrifluoride will show two separate fluorine 'lines' on the chart, one from each compound. By study of the shift and shape of the spectra, the structure and make-up of the compound can be determined.

## Revised Policy on Timber Research Announced

CONTINUING need remains for fundamental research on timber, and for work of immediate benefit to the Forestry Commission and timber users, state the Council for Scientific and Industrial Research in a review of arrangements made in 1958. Under these the Timber Development Association was asked to assume responsibility for certain aspects of timber research carried out by the Forest Products Research Laboratory.

However, the steering committee have become convinced that the new arrangements did not 'allow sufficient lattitude to the laboratory in the discharge of its essential duties, and that the division of functions between the laboratory and other organisations must be more flexible'.

It is now felt that the laboratory's programme should be co-ordinated with that of the Timber Development Association Research and Development Committee and/or of any research association which may be set up.

The purposes of such arrangements are to secure industrial support of work done for the immediate benefit of the timber trade, and also provision for the needs of users—the home producer, the merchant and manufacturer.

## Is There Room for Them All?

# More Competition in Chemical Contracting Follows Set Up of U.S. Firms in U.K.

By 'Contractus'

DURING the last 12 months there have been several new appearances in the contracting world. These can be roughly divided into a number of categories.

1. Setting up of offices in this country by some of the big American giants who have not previously operated in this country to any extent.
2. Associations of large American firms with existing British firms.
3. New or expanded British firms coming into the field.
4. Some of the larger chemical manufacturers setting out to do contract work in the engineering field for bodies outside their own organisations.

Undoubtedly after the minor recession in the contracting field last year, there is something of a boom in the contracting world due to expansion plans by the large chemical firms and oil companies, and due to the establishment of subsidiaries of various overseas companies. How much of this boom is artificial, due to schemes being held back until the General Election results were known, and how much is peculiar to this stage in the progress of the chemical petroleum, petrochemical and process industries, it is difficult to assess, but nevertheless it is in progress, and the situation is, to say the least of it, interesting.

If the structure of the contracting industry in this country is examined and the historical events which have influenced it are borne in mind, the pattern is illuminating.

### Pre-war Pattern

Before the war, the British chemical industry consisted of I.C.I. and a few medium-sized firms, together with a host of much smaller firms. I.C.I. did not go to outside contractors for the design, erection, and procurement of their plants, and much of the equipment used was manufactured by I.C.I. themselves. Thus for a long time British chemical plant manufacturing and contracting industry suffered from a lack of outlets and it was stultified as much of the chemical industry was in a few hands.

After the war a different picture emerged. Due to political reasons it became more economic to refine oil in Europe rather than at the well-head, as before. Many large American chemical companies established branches over here, particularly in the pharmaceutical industry, and due to an expanded health service, and the growth of antibiotics, many new plants were laid down and existing factories were extended. Also, the mighty Distillers Company decided to diversify from their traditional potable products into the chemical industry. Other previously smaller companies in the chemical field expanded and merged to form larger units. New process industries, such as plastics and electronics demanded their share of chemicals, and manufacturing capacity was created to cope with these needs.

The synthetic fibre industry too has grown enormously, with its attendant by-products and demands in the chemical field. In short, now the picture on the consumer side as regards chemical plant in this country is very different. In other countries, too, similar expansions have taken place, and in previously underdeveloped countries whole new industries are being created. All this has brought a market for the chemical plant manufacturers and contracting firms.

Looking at the British chemical plant industry, it is very sharply divided into types of firms. There are those firms which only design, erect, and procure plant, but do not manufacture themselves. Such firms are Constructors John Brown Ltd., Matthew Hall Ltd., Lummus Co. Ltd., Kellogg International Corporation, Foster Wheeler Ltd., Stone and Webster Ltd., etc. In the main it will be seen that these firms are offshoots of U.S. construction firms, with the exception of the first two. These firms have very large staffs of engineers, designers, draughtsmen and others, and are geared more for contracts of £500,000 and over. Many of them obtain the majority of their business from the oil and petrochemical industries, or have done so in the past, but due to increasing competition in this field they are turning more and more to the chemical industry proper, and tendering for smaller contracts. This is in spite of the fact they themselves acknowledge that due to the size and nature of their organisations they find it difficult to compete on smaller contracts.

There are several medium-sized firms, so far as contracting is concerned, some of which have manufacturing facilities behind them, and some of which do not. Such firms are Humphries and Glasgow Ltd., the Power-Gas Group, W. J. Fraser Ltd., Simon-Carves Ltd., Chemical Construction Co. (G.B.) Ltd. (Chemico), etc. Many of these firms have traditional specialities and are leaders in their own field, for example, Simon Carves and Chemico for sulphuric acid plants, Humphries and Glasgow in the gas industry, etc. Others, such as Power-Gas and Simon-Carves are also interested in industries which cannot be called the chemical industry proper, such as the iron and steel industry.

Moving further along the range, there are many firms which manufacture unit equipment which also engage in contracting on a smaller scale. These firms can often compete with their larger, more highly organised, brethren by virtue of the fact that much of the equipment included in the contracts for which they tender, is manufactured by themselves. Also they do not have the vast organisation which may be highly efficient when a complete oil refinery, costing £10 million or £20 million is being built, but which verges on to the ponderous for £50,000 contracts.

Some manufacturers of unit equipment and fabricators nevertheless supply volumes of equipment which are often very substantial, both in terms of money and the amount of design work which is involved, and although they may not rank as main contractors, in terms of volume of business and effort on a particular contract, they may be more involved than many main contractors on other contracts.

### More Consortia

Several consortia have been very successfully formed, and an outstanding example of this is in the nuclear power industry, but this practice has now been extended to other fields, particularly in bidding for overseas contracts.

Several large producing companies are now beginning to enter the contracting field in selling and licensing their process and engineering 'know-how.' Courtaulds in designing and erecting a factory in Russia and Distillers Company in licensing chemical processes are examples.

Against all this background we have seen in the last 12 months or so several new enterprises emerge. Autodrome, with their Project Constructors subsidiary, Fluor Engineering setting up an office over here in order to carry out the Petrolios Mexicanos contract, Blaw Knox Chemical Engineering Ltd. setting up an office with the aim of obtaining contracts, although so far they have yet to announce a really major project. E. B. Badgers have now moved back into this country as Badger Ltd., in spite of having sold most of their previous contracting interests to Stone and Webster Ltd. More recently we hear of the McKhee-Head Wrightson merger.

All of these and other new enterprises mean increased competition. Some companies are well placed to survive the intensely competitive period that must come, others are not so well placed. It will be interesting to see the outcome of events, and well may one ask, "Is there room for them all?"

# FRENCH SOCIETY INVESTIGATES VALUE OF BORON PHOSPHATES IN CERAMICS

BONE ASH, the basis of bone china due to its special fluxing properties, allows articles of china to be made at 1,230° to 1,250°C, thus putting this type of body within the range of potters specialising in felspathic earthenware. Experiments conducted by the Société Francaise de Céramique, under C. Blin indicate, however, that bodies can now be made sufficiently vitrified at 1,180°C and more satisfactorily than normal vitreous bodies. Besides having improved physical properties, the products are stated to have the advantage of being able to be decorated by the same techniques and with the same variety of decoration as earthenware. In particular, the possible results of introducing into ceramic bodies boron phosphates, which have certain fluxing properties, were investigated (CHEMICAL AGE, 19 December, p. 894).

The boron phosphate used has been in the form of a white, hard crystalline powder, of specific gravity 2.81 and corresponding to the chemical formula $BPO_4$ (theoretical composition: $B_2O_3$ : 32.91%, $P_2O_5$ : 67.09%). This compound is insoluble in water, mineral acids (concentration N/10) and organic solvents, and slightly soluble in caustic soda. Its fusion point is above 1,400°C.

## Fluxing Properties

To determine the fluxing properties of boron phosphate, it was examined (a) as a mixture with pegmatite, (b) with pegmatite and kaolin together, and (c) with pegmatite, kaolin and clay mixtures. With (a) proportions of the two components corresponding to the eutectic showing the lowest melting point were found and the resultant flux provided the basis for subsequent tests. With mixture (b) the action of the flux as defined in (a) was demonstrated on a relatively pure aluminium silicate such as kaolin in order to assess translucency as a function of firing temperature. With (c) compositions resulting from partial substitution of kaolin by clays capable of conferring sufficient plasticity on the resultant bodies were examined —thus, moulding properties by jiggering and by casting, translucency at different firing temperatures, and deformation point and the soaking period.

*Boron Phosphate with Pegmatite.* A mixture of equal parts of these components fused between 1,100° and 1,140°C. Using a mixture of 60% boron phosphate to 40% Montebras pegmatite, a melting point between 1,100° and 1,150°C, resulted. The last mixture shows the lowest eutectic. Its softening phase which begins at 1,100°C is very sudden and at 1,120°C, the solution of the pegmatite in the boron phosphate increases rapidly, producing, it is reported, a clearly characteristic state of fusion at 1,140C.

*Boron Phosphate, Pegmatite, Kaolin Mixtures.* All samples (saké-cups) showed good translucency after firing, regardless of temperature. The composition of P.B. flux 65% and kaolin 35% showed an especially strong translucency at the lowest temperature (1,200°C). Kaolin could therefore be replaced in the composition by a suitable white firing plastic clay.

*Boron Phosphate, Pegmatite, Kaolin and Clay Mixtures.* Saké-cups produced at three different firings 1,200°, 1,250° and 1,300°C, all showed sufficient translucency after firing but generalised blistering spoiled the appearance of the surface. A mixture of P.B. flux 65%, Arvor kaolin 15% and Londe clay 20% was subject to different firings at decreasing temperatures (1,150—1,050—1,000°C) with a temperature rise of 50°/hour with half-an-hour's soaking. At 1,150°C the blisters were less but there was still a granular appearance; at 1,050°C the body was glossy and appearance acceptable; and at 1,000°C the surface was satisfactory and translucency remained.

| | C | F | G | H | K |
|---|---|---|---|---|---|
| Boron phosphate ... | 39 | 35 | 33 | 33 | 33 |
| Montebras pegmatite ... | 26 | 26 | 25 | 25 | 25 |
| Arvor kaolin ... ... | 15 | 15 | 14 | 14 | 14 |
| Londe clay ... ... | 20 | 9 | 5 | 5 | 5 |
| A 1 clay ... ... ... | — | — | — | — | — |
| Koy clay ... ... ... | — | 15 | 17 | 8.5 | — |
| Eyzies clay ... ... | — | — | — | 8.5 | 17 |
| Montmorillonite ... | — | — | 6 | 6 | 6 |
| Calcined silica ... ... | — | — | — | — | — |

Body C was found to be difficult to jigger because of low plasticity and it came away irregularly from the mould because of sticking. Plates on supports when fired showed a marked deformation. Body C was modified to body F and this last to bodies G, H and K. It was established that body G, although slightly less white, showed properties in shaping and removal from the mould which was considerably better than H and K. Its translucency is stated to be notable at 1,000°C.

*Comparison with Earthenware and Bone China.* Characteristics of glazed earthenware (talc and dobonite) (F) fired at 1,000°C and a composition of bone china (fired at 1,250°C) were compared with bodies C, F, G, H and K. Results obtained have shown that boron phosphate bodies had, besides a marked translucency, a very low porosity (about 1%), which makes them almost equivalent to china. Mechanical strength proved to be lower, however, as well as the apparent density (between 1.8 and 2). The figures obtained for deformation are of the same order as those characterising bone china and which require similar precautions when setting in the kiln for firing.

Blin reports in his paper that due to its singular melting properties, boron phosphate is usable in the manufacture of ceramic compositions mixed with clay and with pegmatite or feldspar shapeable bodies can be made which are clearly translucent at 1,000°C. The compound also has the further advantage of introducing no impurity since it is a pure chemical. A possible disadvantage, which could be a temporary one only, is the price of boron phosphate, having regard to the high proportions which need to be used in the ceramic bodies. Since the price is based on demand, it is believed that wider application in the ceramic industry of this compound will remove the economic obstacle.

In the U.K. Borax Consolidated Ltd. supply boron phosphate.

# Rapid Mixing of Antibiotics in Animal Feeds at New Bibby Factory

AN outstanding feature of the new £1 million animal foodstuffs factory of J. Bibby and Sons Ltd., is that it will make possible the introduction of minerals or antibiotics at a rate as low as 2 oz. per ton. This high-degree of accuracy results from the development of a new system of mixing and weighing, only recently perfected by Bibby engineers. Thirty-two automatic feeder-weighers will feed the different ingredients into one mixing conveyor and the process will be controlled from an electronic panel.

The new factory will go into production at Lisburn, near Belfast, early next year and will produce about 80 different kinds of feeding stuffs. The building contractors, Holland and Hannen and Cubitts (North West) Ltd. report that their work is now in its final stages.

On arrival the raw materials (grain and protein cakes) will be discharged into a hopper and will pass through a series of conveyors, elevators, magnets and other screening equipment to eliminate dust and other impurities. The grain will then be stored in 32 reinforced concrete silos and drawn off as needed.

After the automatic weighing process, where minerals and additives will be introduced, the materials will be ground to the required fineness and passed to various machines to be made into cubes, pellets, crumbles or meal.

### Evans Medical Open Liberia Offices

The new offices and warehouse of Evans Medical (Liberia) Ltd., were officially opened by the Hon. William R. Tolbert, Jr., vice-president of Liberia, on 9 December 1959. Evans Medical were represented by Mr. M. J. Smith, overseas trade director of the parent company and a director of Evans Medical (Liberia), Mr. William Stout, general manager of the Liberian company and Mr. Emmett Harmon, the legal adviser.

# Zenith Research Reactor Starts Operating at Winfrith Heath

FIRST reactor at Winfrith Atomic Energy Establishment, the Zenith, started operations for the first time on December 19. The final stages of commissioning the plant will be carried out during the next few months. Zenith will be first used by the international staff of the O.E.E.C. high temperature reactor project to establish design characteristics for a 20 mW high temperature gas cooled reactor experiment called Dragon which is to be built at Winfrith.

Dragon is a joint research project by the U.K., Austria, Denmark, Norway, Sweden, Switzerland and Euratom, (Belgium, France, Italy Luxembourg, the Netherlands and West Germany). The agreement provides for research and development, to design, construct and operate a high temperature gas cooled reactor experiment.

An A.E.A. team was responsible for the basic conception of Zenith, for the approval of contractors' designs and for the inspection and commissioning of the plant. Fuel elements and nucleonic instrumentation were designed and produced by the Authority.

### Reactor Core

The Zenith reactor has been built to operate under temperature conditions similar to those expected in a high temperature gas cooled power reactor. The reactor core consists of a nearly cylindrical assembly of 235 fuel elements, 8 ft. high and 4 ft. in diameter, in the form of graphite cylinders, containing pellets of fissile uranium oxide, fertile thorium oxide and graphite, arranged in regular patterns. The ends of the fuel elements are made of solid graphite which, with a 3 ft. thick graphite annulus surrounding the fuel, form a reflector to return some of the neutrons escaping from the fuel into the core, so reducing the quantity of fuel used.

The reactor core is enclosed in a pressure vessel through which the nitrogen gas is pumped in a continuous closed circuit. The nitrogen is heated by a 200 kW heater as it enters at the bottom of the core: the hot gas raises the core mean temperature to 800°C. At the top of the core the hot nitrogen is mixed with cooler gas before passing through the reflector: thus the reflector is kept at a mean temperature of 400°C. At the operating temperatures it is most important to maintain the purity of the nitrogen and a purification system is used to remove traces of carbon monoxide and carbon dioxide. The reactor pressure vessel and associated plant is enclosed in an airtight containing building. The reactor itself will be operated at a peak neutron flux of $10^{8}$ neutrons/CM$^{2}$/sec. at a maximum nuclear power of 100 watts: the nuclear heat produced is thus negligible in comparison with the energy used to heat the core.

Main contractors were the General Electric Co., Atomic Energy Division, Erith. Sub-contractors included British Industrial Gases Ltd., gas circuit regulating valves and gas bottling (heat exchanger) equipment; British Rototherm, thermometers for ventilation system; British Insulated Callender's Cables, mineral insulated thermocouples and insulated heating cables for nitrogen purification plant; Colombian General Blacks, carbon black for thermal insulation; R. Gay and Co., chlorinated rubber paints and chromate primer; Cape Asbestos, lagging discs for nitrogen purification plant; Clyde Rubber Works, rubber sleeves for ventilation ducting; Davidson and Co., h.t. nitrogen circulator, etc.; Evershed and Vignoles, automatic flow control of nitrogen, etc.; Edwards High Vacuum, valves and valve adaptors, Speedivac rotary pumps; Esso, hydraulic fluid; Fibreglass, air inlet filter; Firth Vickers Stainless Steel, Nimonic skirt for core support assembly; Hamworthy Engineering, nitrogen compressor, etc.; G. A. Harvey and Co., ventilation ducts and equipment; Heat Exchangers, nitrogen/water heat exchangers; Honeywell Controls, flux recorder indicators; Igranic Electronics, push buttons, solenoids and contact blocks for control panels; I.C.I., trichloroethylene.

Isopad, Isojacket electric surface heater for nitrogen purification plant; Richard Klinger, valves, 'O' rings and cocks; Londex, process timing unit; Negretti and Zambra, pressure switches; Newalls Insulation, thermal insulation; Newman Hender, bronze valves; Parkhall Pottery, capping tiles and fuel element support; Powell Duffryn Carbon Products, machining and erection of graphite core, bursting disc assemblies; Rotameter, gas flow measurement, flow alarms and metering; J. T. Rothwell, cooler assembly vessels for nitrogen purification plant, etc.; Saunders Valve, valves for reactor services; Serck Radiators, heat exchanger for nitrogen circulator; Sturtevant Engineering, filter plant, etc.; Talbot Stead, thimbles (flux scanning), fuel transit cans and stainless steel tubes; Vandyke Engineering, carbon black seals for reactor core, etc.; Vokes, absolute filters; James Walker, Lioncelle strip for containment dome gaskets, etc.; Henry Wiggin, Nimonic plate; Worthington Simpson, Monobloc pump; Wright Forge and Engineering, fabrication of reactor vessel.

The following firms supplied items by direct contract:—John Laing and Son Ltd., shielding blocks (portland concrete and barytes aggregate blocks); Ministry of Supply, machining of graphite; Morgan Refractories, fertile fuel pellets (thoria); Graviner, graphite spacer pellets, storage cans (fuel); Ashmore, Benson, Pease, nitrogen gas holder; Metrovick, vacuum pumps; H. and E. Lintott, fuel storage safes; Peter Spence, copper oxide pellets for gas purification.

## Nickel Alloy Cuts Maintenance Costs in Ethane Cracking Furnaces

AT National Petro-Chemicals Corporation's plant at Tuscola, Illinois, about 180 tons of ethane are cracked every day. Three Selas heaters are used and together they produce a third of the plant's ethylene for Petrothene polythene, ethyl alcohol and ethyl chloride.

Sealas heaters have been found by National Petro-Chemicals to be unusually efficient, producing large amounts of ethylene from relatively small units. Installed two years ago, the heaters are stated to have had hardly any down time and very little tube maintenance in spite of continuous operation at 1,500°F (820°C).

Process and engineering services for the installation were provided by Stone and Webster Engineering Corporation. Two factors accounting for their good service record lie firstly in the design of the heaters themselves. The tubes are located equidistant between burner walls. The burners, 120 to each heater, are spaced in such a way that heat is applied with uniform intensify to all sides of the coil, preventing overheating. The second factor in low maintenance is the Incaloy nickel-iron chromium alloy for the tubes. Incaloy is a stable austenitic alloy containing about 30 to 34% nickel and about 20% chromium. It resists embrittlement and is claimed to show excellent resistance to carburisation, providing an additional margin of safety during decoking.

Incaloy was developed by International Nickel Co. and is available in the U.K. through Henry Wiggins and Co. Ltd., Birmingham 16.

## Good Market in Iran for U.K. Pesticides

GOOD and growing sales prospects in Iran for U.K. manufacturers of pesticides are reported by the Export Services Branch of the Board of Trade, although it is stated that competition from other supplying countries is keen.

Formation of a number of private companies to undertake crop spraying is announced, and this is stated to have added yet another class of customer to the market and served to increase sales.

Chief suppliers at present are reportedly the U.S., the U.K., Federal Germany, the Netherlands and the Soviet Union. Flowers of sulphur, however, is produced locally by the Ministry of Agriculture.

### Change of Address

As from 5 January the address of the British Welding Research Association will be 19 Fitzroy Square, London W.1, and the telephone number will be Euston 9595/6.

## C.A. Acknowledges Season's Greetings

IN wishing all our readers and advertisers a happy and prosperous New Year, CHEMICAL AGE would like to thank all those who have kindly sent us their Christmas greetings, diaries and calendars. Our thanks are particularly due to the following:

*Desk Diaries:* Albright and Wilson Ltd., Ciba (A.R.L.) Ltd., Shell Chemical Co. Ltd. *Diaries:* British Titan Products Ltd., Imperial Chemical Industries Ltd., Mono Pumps Ltd., Reed Paper Group, Southern Instruments Ltd., Stavely Iron and Chemical Co. Ltd., Thomas Broadbent and Sons Ltd., Widnes Foundry and Engineering Co. Ltd. *Calendars:* Anhydro A/S., Denmark, Haller and Phillips Ltd., Monsanto Chemicals Ltd., John and E. Sturge Ltd., Verenigde Machinefabrieken, Holland, Wilfrid Smith Ltd., Esso Petroleum Co. Ltd. and The Press at Coombelands Ltd.

# MODERN TRENDS IN COSMETIC FORMULATION

MODERN trends in formulation were the subject of a recent lecture given by Dr. W. W. Myddleton at a meeting of the Society of Cosmetic Chemists, when Dr. R. H. Marriott was in the chair, in which the lecturer concentrated attention on individual raw materials and the manner in which they had been modified to improve their cosmetic properties.

The search for germicides had led to the recently suggested use of triacetin in creams, which functioned through the slow release of acetic acid by esterases normally present in the skin. Similarly, attempts had been made to reduce the unpleasant odour and irritant properties of formaldehyde by reacting with urea or substituted hydantoins to give products which slowly released free formaldehyde.

Unsaturated fatty acids, Dr. Myddleton observed, suffer from the disadvantage of ease of development of rancidity and it was interesting to note that linoleic acid urea adduct and isopropyl linoleate did not become rancid. He also made the ensuing references and observations. Starches would withstand boiling with water after reaction with a tetramethylol urea acetylene compound and their resistance to bacterial attack was increased.

In the field of antiperspirants the gelation of aluminium chlorohydroxide solution by the addition of boric acid or borax in the presence of glycerine was mentioned as well as the reaction of allantoin in the enolic form to give a 1:1 salt with aluminium chlorohydroxide. Referring to liquid shampoo formulations, he said that condensation of the lauryl alcohol with ethylene oxide prior to forming the alkyl sulphate led to a product whose sodium salt had satisfactory water solubility at low temperature, was readily gelled and was free from discoloration in the presence of iron.

Dr. Myddleton then mentioned some of the apparent contradictions shown by some formulations. Silicones had many uses as antifoaming agents and it was rather surprising to find they had been incorporated in shampoos with excellent results, giving good foam and having a conditioning effect on the hair.

Anionic and cationic surface active agents though normally regarded as incompatible had been the subject of patent application for their use in equimolecular proportion in cream formulations as emollients and thickeners. Similarly, the alkyl phosphate esters, though rather poor surface active agents in comparison with the alkyl sulphates, were of value in emulsion formulation, the triester giving W/O and the diester O/W emulsions.

The unsatisfactory result obtained when using bisulphites followed by a bromate salt in hair waving is now claimed to have been overcome by the use of hexamethylene tetramine as 'neutraliser' at a pH not lower than 6 in the presence of a trace of oxidising agent.

## *Two New Italian Copolymers*

TWO types of transparent thermoplastic copolymers which will soon be marketed under the name of Dialux, have been developed by Snia Viscosa, Italy. Work on other types of copolymers intended for special uses continues in the company's laboratories.

Dialux A has the following properties:

Hardness (Rockwell) ASTM D 785: M88.

Resistance to traction: ASTM D 638: 585 Kg. per sq. cm.

Lengthening under traction, at breaking point: ASTM D 638: 1.66% Kg. × cm.

Resistance to compression: ASTM D 695: 935 Kg/cm².

Resistance to flexing: ASTM D 790: 950 Kg/cm².

Temperature of heat distortion ASTM D 648 66 P.s.i.: 103°C.

Softening point: Vicat ASTM D 1525: 113°C.

Water absorption during 24 hours at 20°C. ASTM D 570 : 0. 12%.

Transparency (in spectrophotometer): 85%.

Refraction index: 1.56.

Specific gravity: 1.14.

Tests with various corrosive chemicals and solvents, have, however, shown that Dialux A displays poor resistance to benzole. Striving to eliminate this weak point, Snia research workers developed Dialux B, a ternary copolymer (methyl, styrene and acrylonitrile).

The new substance not only resists the action of benzole, but displays a better resistance to lengthening, shock, compression and bending, than its precessor. Its thermal resistance and hardness are, however, slightly inferior.

The results of the research into these copolymers (carried out by Dr. E. Condorelli and Dr. L. Spano) have disclosed the fact that the naturally weak polyitaconate combined with styrene yields copolymers that display greater mechanical and thermal strength than polystyrene.

It is claimed that the new resins are generally superior to polystyrenes used in moulding, and that they approach the polymethylmetacrylates.

### Research Station Wins Award

The modern fertiliser research station of Fisons Ltd. at Levington, Suffolk, has won the Civic Trust County Amenity Award for East Suffolk—for the building or buildings completed between May 1956 and May 1959, in the design of which most regard has been paid to their relationship with their surroundings.

## Arrangements for Coming Chemical Symposia

A SYMPOSIUM 'Recent developments in textile chemistry' will be held on 13 February at the Bradford Institute of Technology. This will include: Fibres in terms of molecular flexibility; Recent developments in acetate and acrylic fibres; New tests for wool fibre damage; and Developments in wool chemistry.

The Society for Analytical Chemistry, the Iron and Steel Institute and the Institute of Metals, are holding a Joint Symposium on Tuesday and Wednesday, 3 and 4 May, 1960, at Church House, Westminster, on "The determination of gases in metals", covering the determinations of oxygen, hydrogen and nitrogen in a general way.

The first international congress on metallic corrosion will be held in South Kensington, London S.W.1, from 10 to 15 April, 1961, under the presidency of Sir Harry Melville.

The Fertiliser Society and the Society for Analytical Chemistry are holding a joint symposium on fertiliser analysis at Church House, London S.W.1 on 21 and 22 April. Registration fee is £1 and forms are available from the Fertiliser Society, 44 Russell Square, London W.C.1.

'Advances in the chemical analysis of fertilisers, soils and plants,' is the title of a symposium to be held by the Agriculture Group, Society of Chemical Industry, on 20 and 21 April at the same venue. Details from Dr. P. W. Arnold, Rothamsted Experimental Station, Harpenden, Herts.

## A.E.A.'s First Use of Borated-graphite Blocks

IN their fast breeder reactor at Dounreay, the Atomic Energy Authority used for the first time special borated-graphite blocks in the assembly of the shield surrounding the reactor vessel. The blocks were made and machined by the Morgan Crucible Co. Ltd., at Norton, near Worcester. This factory does not produce nuclear pure material but was chosen as being suitable for handling large quantities of boron compounds.

Purpose of the borated-graphite is to slow down fast neutrons and then absorb them in the shortest possible distance. Most of the borated-graphite contained 0.3% boron, but some contained 5%; in both cases the boron was very uniformly distributed throughout the graphite. The blocks were machined to 500 different patterns, some of them extremely intricate.

### Monopolies Report on Fertilisers

Before the House of Commons rose for Christmas Mr. F. J. Erroll, Minister of State, Board of Trade, asked what were the reasons for the delay in publishing the Monopolies Commission's report on the fertiliser industry, replied that it was now with the printers. It would probably be ready for publication in February. The report was laid before Parliament on 24 July last.

## Overseas News

# ITALIAN NATURAL GAS PRODUCTION SHOWED 12.7% INCREASE IN 1959

ACCORDING to the Italian State holding company E.N.I., estimated natural gas production in Italy for 1959 is 5,700 million cubic metres, or 12.7% more than in 1958. Up to the end of October some 4,700 million cubic metres had been produced. Three new deposits are said to have been discovered in the Po Valley and a further deposit in the Abruzzi. The Government is to arrange the processing of natural gas obtained in the Ferrandina area; this is one of the most underdeveloped areas of Italy and there are hopes that natural gas might be the basis for a local industry if it could be processed at or near deposit sites.

Reports from Milan indicate that the small private natural gas exploitation concerns in the Po delta area are planning to process their gas chemically. These are interested in the new company, Società Methana, the concern with an initial capital of over 700 million lire which is to build a petrochemical plant at Adria near Rovigo. A West German finance group is also said to be interested in this scheme, for which it would obtain the plant and equipment. The Adria plant is intended to produce initially intermediate products and later synthetic fibres.

### New Canadian Company Will Produce Nitrogen Products

Initial public financing of a $17 million chemical plant to be built by the Sogenines, Ltd. group at Maitland, Ontario, on the St. Lawrence River, will be undertaken in the near future, it is understood. The new chemical company, Brockville Chemicals Ltd., plans to produce such products as ammonium nitrate, nitrogen solutions, anhydrous ammonia and hydrogen.

Anhydrous ammonia and hydrogen will be supplied by pipeline to the Maitland works of Du Pont Co. of Canada, and the plant will use Alberta natural gas as its principal raw materials. It will employ about 185 persons and is expected to be completed early in 1961.

### Chemicals Main Item in International Fund

The international investment fund Europafonds I (not to be confused with the Eurunion fund, see CHEMICAL AGE, 21 November, p. 746), founded on 21 January 1959, was worth an equivalent of approximately £3,790,000 by 30 June, it is announced from Frankfurt-on-Main at the end of December. This sum was accounted for by the sale of 362,000 shares. As at this date the chemical industry accounted for the major holding of shares, some 24.2% of the fund's holdings falling in this branch of industry. The mineral oil industry accounted for 4.4% of the fund. By 10 August issue price of fund units had risen from the original 100 German marks to 149.60 marks, and dividend and interest per share had reached 4.42 marks. Since 30 June the fund's holdings have risen further to 52 million marks or about £4,340,000, and the financial year 1959 is expected to end in a satisfactory result.

### New Nitrogen Plant Planned in Finland

Setting up of a further nitrogen production plant in Finland has recently been recommended by a committee appointed by the Government. The new entity would be run in connection with State-owned refinery Neste Oy Naantali. Production in 1958 by Typpi Oy, amounted to 34,600 tons.

### Israel May have Petrochemical Industry in Negev

Plans are reported from Israel to erect a I£10 million petrochemical industry in the Negev, where by cracking crude oil it is hoped to produce 3,000 tons of ethylene, two-thirds of which will be used in the manufacture of ethylene dibromide for export and the remaining 1,000 tons for the plastics industry. By-products (kerosene, gasoline, fuel oil and cooking gas) will be absorbed by industries in the area and intermediate products will be used for the manufacture of synthetic detergents.

### Rubber Auxiliaries from Naugatuck-Rumianca

Jointly owned U.S. Rubber and Rumianca S.p.A.'s, Naugatuck-Rumianca S.p.A., have begun operation of a newly built plant in Borgaro Torinese, Turin. Tonnage lots of B-L-E, a chemical developed to increase the service life of rubber products, are now being produced. Next product scheduled for production is Polygard, a non-staining stabiliser. These two products will be followed by a complete range of antioxidants, accelerators, and speciality chemicals.

### New U.S. Lithium Purification Process

Impurities in commercial grade lithium, in particular, nitrogen and oxygen, make this rare earth substance too corrosive for use as a high-temperature, high-performance coolant in nuclear reactors. Now, however, Oak Ridge National Laboratory, Tennessee, reports that it has developed means of reducing nitrogen and oxygen content below 100 p.p.m. By filtering gas-packed lithium under argon at 250°C, the bulk of these contaminants is removed. Use of active titanium sponge at 800°C for 24 hours lowers nitrogen to the desired level while cold-trapping does the same for oxygen content.

### Japan to Liberalise Imports by Stages

The Japanese Government, from 15 January, is simplifying the import of foreign scientific instruments and certain industrial plant by putting these under a new import system. This is to be known as the automatic allocation system, and, as is the case with the Japanese automatic approval system, will result in a complete liberalisation of imports. As from 1 January 1961, 65 commodities, at present imported on quota and consisting primarily of chemical products, are to be freed from import restrictions.

### Spain May Increase Chemical Import Quotas

A second world quota list, details of which are issued in Madrid, projects the increase in the import quota for pest control media of $2 million. Also on the list are stated to be quotas of insulin and poliomyelitis vaccine for $1,500,000, synthetic fibres for $1,700,000, porcelain and glass for industrial and laboratory use for $750,000, fireproof material for $1,500,000, special papers for $1,500,000, chemical products for the textile and leather industries for $1 million, dyestuffs for $1 million, and various industrial chemical products for $3 million.

### Pechiney to Raise Ethylene Production

With expansion of installations at the Lavéra, near Marseilles, plant of Société Naphtachimie, production capacity of ethylene in the second half of 1960 will rise to 48,000 tonnes annually from a level of only 18,000 tonnes per year. Péchiney, who are interested in Lavéra, have raised chlorine output to 300 tonnes per day, and the subsidiary company Organico, producers of plastics and synthetic fibres, have increased turnover by about 50% during 1959.

### Extraction of Sulphur from $SO_2$ Described as 'Encouraging'

Encouraging results in the initial eight months' operation of a pilot plant for obtaining pure sulphur from sulphur dioxide in the high quality roaster offgas at Inco's large iron ore recovery operation in the Sudbury district of Ontario, are announced by Texas Gulf Sulphur and International Nickel of Canada. Feasibility of large tonnage commercial production will be determined in part by costs as projected from further pilot operations. It also will be affected by the future price of sulphur.

The plant was completed last year and, with associated facilities, cost over $500,000. Initial operations consisted of

test runs, but since last April operations have been round-the-clock, and will be continued on this basis in an attempt successfully to conclude the development programme.

Sulphuric acid and liquid sulphur dioxide are now being produced in quantity from Inco smelter gases, but because of storage and shipping limitations as to these products it has not been possible to market all the sulphur available from such gases. In the event that the sulphur values in smelter gases can be reduced economically to elemental sulphur "the utmost flexibility of storage and transportation will be achieved".

The sulphur is extracted by reacting high quality sulphurous gas with a chemical reducing agent at high temperature over a specially developed catalyst. Among the three satisfactory reducing agents, natural gas (now available at Copper Cliff) has some technical advantage over propane gas or fuel oil, but selection will remain flexible in the light of cost. Many years' work in laboratories of Texas Gulf Sulphur had proved the extractive process chemically sound, but a pilot operation was required to evaluate engineering aspects upon which economic commercial production will depend.

## Border Chemical to Produce $H_2SO_4$ at Maitland Plant

Border Chemical Co. have completed the foundations for their new chemical plant in the Birds Hill area on the outskirts of Winnipeg. Equipment for the plant is arriving at the site and the programme is ahead of schedule. The sulphuric acid plant, with a rated capacity of 50 tons daily, is expected to be in production by next April.

Initially, the plant will manufacture sulphuric acid through direct burning of sulphur, but ultimately it is planned that supplies of sulphur dioxide will be supplemented or obtained solely through the roasting of sulphur concentrates to be produced by New Manitoba Mining and Smelting Co. Ltd.

## First Crude from Esso's New Dutch Refinery

The first crude oil from the new Esso refinery near Rotterdam's Third Petroleum Harbour arrived on 4 December. The building of this plant started in May 1958, and this supply of oil is meant for the testing of the first part of the plant towards the end of January. The official opening of the full installation will probably occur in May.

## Electrical Semi-conductors from Plastics in U.S.S.R.

The Institute for Petrochemical Synthesis of the Russian Academy of Sciences claims to have succeeded in producing electrical semi-conductors from organic substances. Plastics, it is said, will now be able to replace the rare germanium, silicium and similar elements which up to now have been used as material for such products. This may signify the replacement of inorganic substances by organic substances in such products as transistors and rectifiers. The first experimental semi-conductor of this type was manufactured from polyacrylonitrile, it is stated. The new substance "has its advantages in cheapness, durability, light weight and ease of processing to shape."

## U.S. Polythene Price Cut

Polythene prices have been cut by 2½ cents to 32½ cents per lb. in carload lots. Koppers Co. report that their cut applies to all densities of 0.940 gramme per cubic centimetre and below. A 2½ cent cut is also reported by Spencer Chemical while Union Carbide Plastics have said that, because of the impact of low offers, they had instituted a 2½-cent discount from their published prices. Bulk quantity allowances have been continued by Carbide and in hopper car shipments of 100,000 lb. of polythene or more, the allowance is still 1 cent per lb., making the new net cost to large buyers 31½ cents.

## Increased Investments for Canadian Chemicals

An increase in capital investment by the chemical industry has been forecast for 1960 by Mr. P. C. Allen, president of Canadian Industries Ltd. Investment by the industry was cut back moderately last year, but the low point has now been passed. The current capital programme, however includes few diversification projects, and is concerned mainly with plants for manufacture of chemicals already produced in Canada.

Industry sales improved during 1959 after a slow start caused by lower export sales early in the year, and a protracted strike in the synthetic rubber industry. Further improvement in sales is expected in 1960, although intense competition for the Canadian market for chemicals, both from foreign and domestic producers, is likely to continue. It is predicted that profit margins will be low.

## First Du Pont Plant Operates in Europe

Start of trial operations of Du Pont's paint products plant at Malines, Belgium, was recently announced, and full production is scheduled for March, to supply the Benelux countries.

Located on a 17-acre site and operated by Du Pont de Nemours (Belgium) S.A., the plant will produce lacquers, enamels, paints, varnishes and thinners for the motor, industrial and household fields, and will employ about 100 people.

## Canadian Subsidiary To Produce Aluminium Chloride

A newly formed Canadian subsidiary of a U.S. chemical company has purchased 20 acres of land in the former Sarnia Indian Reserve. The Canadian firm to be known as St. Clair Chemical Ltd. Construction of a concrete block building of approximately 8,000 sq. ft. will begin shortly, and production is expected to start early next year with plant capacity of approximately 4 million lb. of anhydrous aluminium chloride per year.

# U.S. Exports of Sulphur Near Record High Levels of 1956

EXPORTS of U.S. sulphur increased for the second consecutive year to virtually equal the record tonnage exported in 1956. At the same time, domestic consumption has reached a new record level.

In an annual review, Langbourne M. Williams, chairman of Freeport Sulphur Co., has reported preliminary data indicating that exports have exceeded 1.6 million long tons and that final figures may show the total to be above the 1.651 million tons shipped four years ago.

Major importing countries and the estimated tonnage shipped have been as follows: Canada, 300,000 tons; U.K., 265,000 tons; Brazil, 130,000 tons; India, 125,000 tons; and Australia, 115,000 tons. All sales of U.S. sulphur outside the North American continent are handled by the Sulphur Export Corporation, which is jointly owned by the four U.S. Frasch sulphur producers.

Record consumption of sulphur in all forms in the U.S. is an estimated 6 million tons, an increase of better than 10% over 1958. The previous record of 5.8 million tons was established in 1956.

Freeport Sulphur attribute the greater domestic use of sulphur to the pick-up of business by major consuming industries such as fertiliser, chemicals, paper, pigments and rayon. Although demand by the steel industry dropped as a result of the strike, the weakness in this market was more than offset by the prosperity of most of the other consuming industries.

Domestic sulphur production was up slightly in 1959. Output from all sources amounted to an estimated 6.225 million long tons, compared with 6.140 million tons in 1958. Most of the increased demand was met from stockpiles of producers, who cut back stocks from 4 million tons to about 3.4 million tons.

Of the total production, an estimated 4.525 million tons were elemental sulphur mined by the Frasch hot-water process from salt dome deposits located along the coast of Louisiana and Texas. Of the balance of the output, 740,000 tons represented elemental sulphur recovered from refinery gases and sour natural gas; 450,000 tons sulphur contained in pyrites; and 510,000 tons sulphur in various forms from other sources.

Imports of sulphur, although at a high level, have failed to maintain the sharply rising trend begun in 1955 with the development of Frasch-process mines in Mexico, Mr. Williams notes. Total imports—including Frasch from Mexico, recovered sulphur and the sulphur content of pyrites from Canada—have about equalled the 755,000 tons shipped in 1958.

# PEOPLE in the news

● **Mr. G. Loasby,** director and technical manager of British Nylon Spinners, who has been chairman of the Textile Institute's council since 1955, has been in India since the early part of 1959 at the request of the Silk and Art Silk Mills' Research Association, to advise and assist them in their reorganisation. Mr. Loasby has found that his services are required in an advisory capacity for longer than he at first expected, and has felt, therefore, that he must resign from his office as chairman. He is succeeded by **Dr. A. R. Urquhart, F.R.I.C., F.T.I.,** who is assistant director at the British Cotton Industry Research Association. Dr. Urquhart, who recently received the institute's Service Medal, has been hon. secretary of the institute since 1958. **Mr. J. C. H. Hurd, F.T.I.,** head of the School of Textiles, Leicester College of Technology and Commerce, has been appointed hon. secretary.

● **Mr. M. H. Akeroyd** has been appointed Midlands area sales manager, Laporte Industries Ltd. He will be a member of the staff of A. W. Brook Ltd., a wholly-owned subsidiary of L.I.L., who act as a selling organisation for the Midlands area.

**Mr. G. P. Davidson, who becomes managing director of Head Wrightson Processes on 1 February (see 'Chemical Age', 26 December 1959) received his education in Germany and Sweden**

● **Dr. A. W. Merrison,** of the European Organisation for Nuclear Research, has been appointed to the chair of experimental physics, Liverpool University, and is expected to take up the appointment on 1 October 1960.

● **Mr. Wolfgang Mey,** who has been appointed general manager of Q.V.F. Glastechnik, Wiesbaden, subsidiary of Q.V.F. Ltd., Stoke-on-Trent, was previously commercial manager.

● **Mr. Edward A. O'Neil,** chairman of Chemstrand Ltd. and president of the Chemstrand Corporation of New York, has been appointed to the chairmanship of the Man Made Fibre Producers' Association of the U.S., in succession to Mr. Andrew E. Buchanan, Junior.

● **Sir James McKinnon,** who retired as Chief Inspector of Customs and Excise on 31 December, has been succeeded by **Mr. Bertram Mitchell,** deputy chief inspector, who is aged 61 and who entered the service in 1914. **Mr. A. B. Hadley,** who has been appointed higher collector at the head of London Airport collection area of Customs and Excise, was a senior inspector in the chief inspector's London headquarters.

● **Mr. J. C. FitzGerald** has joined the board of Bataafse Internationale Petroleum Mij. N.V. from 1 January. **Mr. H. William Slotbloom** joined the board of Shell Internationale Research, Mij. N.V. from the same date. Mr. FitzGerald and **Mr. D. de Bruyne** have each been appointed general attorney of Bataafse Petroleum Mij. N.V.

● **Sir Miles Thomas,** chairman of Monsanto Chemicals Ltd., and past-president of the Advertising Association, is to be chairman of the International Congress of Outdoor Advertising to be held in Toronto next July.

● **Mr. W. J. Parker** has resigned his position as hon. secretary of the Polarographic Society. **Mr. J. H. Glover** has been co-opted to succeed him and all communications to the society including subscriptions should be sent direct to him at 75 Craven Gardens, Wimbledon, London, S.W.19.

● **Dr. Eng. Z. Swiecki** of the Department of Inorganic Chemical Technology, Institute of Technology, Wroclaw, Poland, has been invested with the title of visiting lecturer at Sheffield University, where he will remain until next July.

● **Dr. A. K. Galwey, B.Sc., Ph.D.,** and **Dr. B. D. Flockhart, M.Sc., Ph.D.,** have been appointed to supernumerary lectureships in physical chemistry at the Queen's University, Belfast.

● **Mr. J. A. Metcalfe** has been appointed a director of Minerals Separation as from 1 January.

● **Mr. Norman L. Dickinson** has been appointed manager of process engineering, Kellogg International Corporation, London, and will be responsible for analysis of plant problems, planning and execution of process engineering in design of refineries, chemical plant and other industrial complexes. Previously he was manager of the refinery plans division of the concern's New York office, and holds various North American degrees in science and engineering.

**Mr. N. L. Dickinson, who becomes process engineering manager of Kellogg International**

● **Mr. J. A. Sharp,** research chemist with the Coal Tar Research Association, has been awarded the degree of Doctor of Philosophy. In 1956 he graduated at Leeds University, in colour chemistry. His father, Mr. C. A. Sharp, is works manager with the Bradford Dyers' Association.

● **Sir David Anderson,** who last week received a presentation to mark his retirement as director of the Royal College of Science and Technology, Glasgow, handed back the major part of it—a cheque for £200—to the college. He asked that the money be used to found a new prize in general studies, so that no one department would be favoured. Sir David, who retires at the end of the year, was also given a silver coffee pot, a portable typewriter, and a painting by Sir D. Y. Cameron.

**Mr. Alex N. Willis, until recently chief development engineer of Mine Safety Appliances, has been appointed managing director of Willis Instruments Ltd. (see page 21)**

## Obituary

**Dr. Erich Boehm, D.Phil., F.R.I.C.,** who died in Cardiff Royal Infirmary on 28 December, was managing director of Nipa Laboratories Ltd., Pontypridd.

**Mr. G. H. Spilman,** chairman of British Celanese Ltd., has died at the age of 71. He was appointed to the board in 1927, some six years after joining the company, and became managing director in 1945. From 1952 Mr. Spillman was vice-chairman until his appointment as chairman in 1957.

**Dr. Cecil Pepper, B.Sc., Ph.D., F.Inst.Pet., F.R.I.C.,** managing director of Alexander Duckham and Co. Ltd., lubrication technologists, London, has died. He joined the company as a research chemist in 1936 and became a director in 1941. From 1952 he was joint managing director until his appointment early this year as managing director.

### Unusual Apparatus to be Exhibited by Cosmetic Chemists

An exhibition of unusual laboratory apparatus is being arranged by the Society of Cosmetic Chemists and it is hoped to hold it in conjunction with a lecture that Dr. R. H. Marriott is giving on 7 April. Miss L. P. Torry, Lentheric Ltd., Standard Works, Lawrence Road, London N.15, who is organising the exhibition, would like to hear about equipment that would interest other members.

# Commercial News

- **Reduced Trading Profit for Bowmans**
- **Slight Drop in S.A.I.'s Fertiliser Sales**
- **U.S. Borax's Record Sales & Better Earnings**
- **Bayer Shares Now on Swiss Bourses**

## M. L. Alkan

Manufacturers and suppliers of chemicals and metals for electroplating and of machinery for electroplating purposes, M. L. Alkan Ltd. announce an interim dividend of 15% for the year ended 30 September 1959. No further distribution will be made for 1958-59. Net profit of £27,324 compares with £25,472 after tax of £27,145 (£17,894).

## Bowmans Chemicals

Trading profit of £39,756 for the year ended 31 October 1959 is announced for Bowmans Chemicals Ltd. compared with £48,351 previously. Dividend is maintained at 10%, with an unchanged final of 6%.

Net balance is £12,298 against £16,567, after tax of £12,157 (£18,935), and depreciation of £15,301 (£12,849). Plant obsolescence and special depreciation absorbs £14,900 (£2,500), and £7,177 is utilised to eliminate the overhead content of finished stocks and work-in-progress this year.

## Fisons Fertilizers Ltd.

The above-named company, which has been formed since Fison's decision to convert Fisons Ltd. into a holding company (see CHEMICAL AGE, 14 November 1959, page 681), will handle all business and current contracts accruing to the latter named concern from 1 January 1960.

## Scottish Agricultural Industries

Total sales of all classes of fertiliser of Scottish Agricultural Industries, which is controlled by Imperial Chemical Industries Ltd., in the year to 30 September 1959, were all slightly less than for the previous season. Allowing for the abnormalities in the pattern of deliveries in 1957-58, however, the level of the year's sales indicates that the rising trend of fertiliser consumption is still continuing, the directors record.

There was an appreciable increase during the past year in the volume of sales of compound feeding stuffs. Also in spite of the fact that the company had substantially reduced the price of a number of its fertilisers in 1957-58, some further reductions were made. Farmers, it is reported, are showing an increasing preference for the new concentrated compound fertilisers produced at the Leith works, with the result that demand for superphosphate and superphosphate-based compounds has contracted further. Hence, no further production has been required from the works of Port Dundas, and the land and buildings have been sold. With the strong demand for concentrated compound fertilisers, the new Leith works have been producing at a high rate throughout the year.

Group net profit applicable to the parent company advanced from £560,911 to £610,984, the dividend is raised from 10% to 12% and a one-for-four scrip issue is proposed. Group fixed assets total £4,208,103 (£4,318,697) and there are commitments of £122,000 (£320,000). Net current assets rose from £3,539,924 to £4,160,380.

## U.S. Borax

United States Borax and Chemical Corporation have achieved record sales and improved earnings for their fiscal year ended 30 September 1959, when sales increased 17% to $62,191,620 ($53,057,764). Net income amounted to $6,048,249, equivalent to $1.29 per share, and final quarter's earnings of 29 c. per share were a record for the period. There has been increased demand for borax products in industry and agriculture in the U.S. and abroad, and sales of 20 Mule Team consumer products also recorded significant advances. Potash volume improved although potash prices remained low.

Expenditures for research were $1,558,339, the highest in the company's history, and new products were developed which are expected to contribute to future profits. U.S. Borax Research Corporation also made progress in its fundamental long range studies into the fields of organic and inorganic boron chemistry. During 1959, the research corporation obtained renewals of two classified Air Force contracts first awarded in 1958.

## Washington Chemical Co.

Production of magnesia and other chemicals at the factories of the Washington Chemical Co. Ltd., one of the companies of Turner and Newall Ltd., is stated in the parent company's annual report to have been at a very high level throughout most of the year ended 30 September 1959. Production was in fact appreciably in excess of last year's output, both in tonnage and in value. Demand for these products proved to be of a sustained character from abroad as well as at home.

## Brockville Chemicals

An offering of 1,300,000 6% $10 participating preferred shares of Brockville Chemicals Ltd., Canada, is expected soon. The company, incorporated in August 1959, plans to manufacture industrial chemicals and fertiliser materials in a plant to be built at Maitland, Ontario. Major interest is held by Sogemines Ltd. Brockville Chemicals will spend some $19 millions on their new plant, scheduled for completion during the first half of 1961.

## Anglo-Lautaro

According to a resolution of the directors of the Anglo-Lautaro Nitrate Corporation, payment of the dividend of 70 cents (U.S.) per 'A' share, with corresponding pro-rata amounts on 'B' and 'C' shares will be made only on the basis of a sum which can be economically distributed.

Since the dividend amounts to only 1.45 cents per share on the 'B' shares and 7 cents per share on the 'C' shares, the directors are withholding payment to holders entitled to receive a total dividend of less than 50 cents until, in combination with accumulated dividends and/or dividends subsequently declared, a total of 50 cents is reached.

## Chemstrand Corporation

The Chemstrand Corporation have paid a dividend of $5 million divided between its two share-owners, American Viscose Corporation and Monsanto Chemical. The company has also repaid $5 million of its 4% subordinated notes due in 1977, which are held by the two parent companies, leaving a balance outstanding of $24 million.

## Degussa

The Frankfurt-on-Main chemical producers Deutsche Gold- und Silberscheideanstalt (Degussa) are assimilating two companies in the same way as two were recently assimilated (see CHEMICAL AGE, 12 December) by the Farbwerke Hoechst concern. In this case the companies are the pharmaceutical firm of Chemiewerk Homburg, a subsidiary of Degussa, and Chemische Fabrik Wesseling. Both firms will keep their present managements and titles.

## Dynamit Nobel

In partnership with the Swiss Oerlikon-Buehrle group, Herr Friedrich Flick has been voted into full control of Dynamit Nobel, West Germany's leading manufacturers of plastics products. A shareholders' meeting produced a 25-to-1 majority in favour of the proposal to buy out minority shareholders. Shareholders ejected by the takeover will be paid DM 735 for each DM 100 nominal.

Herr Flick will be the dominant partner in the new Dynamit set up as the Swiss group had only 24% of the nominal capital. The German financier proposes to run the company in closest collaboration with Feldmühle, manufacturers of paper and chemicals, in his control.

## Erdölchemie GmbH

Erdölchemie GmbH, of Dormagen-on-Rhine, the petrochemical joint subsidiary of B.P. Benzin und Petroleum AG, of Hamburg, and Farbenfabriken Bayer AG, of Leverkusen, have raised their capital of DM.22.500 million, or about £1.875 million, to a new level of DM.110 million, or some £9.167 million. The company's first capital raise, from the

nominal sum of DM.50,000 to DM.87.500 million, took place a year ago.

### Farbenfabriken Bayer AG

Shares of the West German chemical manufacturing concern Farbenfabriken Bayer AG are being introduced to the bourses of Zurich, Basle and Geneva, in Switzerland. The shares are now on the Swiss stock exchanges as well as on the bourses of Paris and Vienna, Amsterdam, and in the U.S. under the American Depositary Receipts scheme.

### Houdry Process

A dividend of 50 cents per share has been declared by the Houdry Process Corporation, Philadelphia. Consolidated earnings for the year will be about $2.25 per share ($2.15). Parent company earnings for 1959 increased substantially over 1958 while the Catalytic Construction Co. earnings for 1959 declined materially.

### Knapsack-Griesheim AG

Over the first 10 months of 1959 the Knapsack-Griesheim concern's turnover rose by 16%, and increased sales were reported for almost all branches of production, both in the organic and inorganic sectors. A further extension to the plant's monochloroacetic acid unit is soon to be brought into operation and vinyl chloride production, already up by 50%, is to be raised in the future. A further expansion of capacity was possible in 1959 in acetic acid and acetic anhydride manufacture, and work on the expansion of phosphoric acid, polyphosphate and pyrophosphate capacities will be finished by early 1960, and acetylene production is continuing to rise.

### Montecatini

It has been announced by the Societe Per Azioni Montecatini that the public subscription lists for their 20-year 5½% debenture loan will be open from 4 to 21 January. The issue price is 990 lire per 1,000 lire debenture, and the loan is expected to raise 30,000 million lire, which is to used for a further expansion of petrochemicals activities. The loan is being offered to the public by a consortium of banks headed by the Mediobanca, of Milan.

### Rhodiaceta

Largest producer in France of man-made fibres, Rhodiaceta S.A., announces an increase in capital to F.Frs.15,480 million from F.Frs.11,610 million by a one for three scrip issue of 387,000 shares of F.Fr.10,000. Rhodiaceta is the joint subsidiary of Rhône-Poulenc and Celtex, each of which holds 50% of the shares.

### Società Edison

The Institute for Industrial Financing in Sicily has granted credit to petrochemical subsidiaries of the Società Edison. Of these, Sincat, with a capital of Lire 5,000 million, and works at Melilli, near Syracuse, and Caltanissetta, received together Lire 10,000 million credit from the Institute and the Lire 3,000 million company Celene, at present building installations at Melilli worth Lire 5 million.

### Titangesellschaft mbH

Titangesellschaft mbH, of Leverkusen, West Germany, are raising their capital of DM.15 million (£1.250 million approx.) to a new level of DM.43 million (about £3.585 million). The company will continue to belong to the National Lead Co., of New York. In 1960 Titangesellschaft, 50% of which was until 1952 owned by the former I.G. Farben concern, will produce some 70,000 tonnes of Kronos titanium dioxide.

### Rhone-Poulenc

The French pharmaceutical and chemical manufacturer Société des Usines Chimiques Rhône-Poulenc intend to raise the company's capital from FFrs.18,945 million to a total of FFrs.25,260 million, or about £1,804 million. Some 1,263,000 shares of a face value of FFrs.5,000 will be issued at a rate of FFrs.8,000 and in a ratio of 1 to 3.

# TRADE NOTES

### I.C.I. Polythene Cheaper

A reduction of 3d per lb. to 2s 3½d per lb. has been made by the I.C.I. Plastics Division for Alkathene. It is hoped that the new reduction will further stimulate the expanding market for polythene. The cut has been made following improvements in efficiency and costs as a result of bringing into operation extensions to I.C.I. polythene plants at Wilton: these are now capable of running to full capacity.

### Change of Address

Address of Dr. A. J. Skey, European representative of Amoco Chemicals Corporation, is now 10 Stratton Street, London W.1. (Tel. Grosvenor 3502).

### Phenolic Resin Foams

Bakelite Ltd., 12-18 Grosvenor Gardens, London S.W.1, have published advance information sheet B.36 entitled 'Bakelite Phenolic Resin Foams', giving details of a low-density cellular material recently developed for use in thermal insulation and as a lightweight core material for building panels. Information is also provided on the special machines which have been developed for rapid mixing and dispensing of the foams. The company supply a resin, a hardener and a foaming agent for mixing together to make the foams. The complete mixing and foaming process is said to take less than 10 minutes.

### Esso Price Revisions

The Esso Petroleum Co. Ltd., Chemicals Dept., 50 Stratton Street, London W.1, have revised prices of their butyl rubber, regular grades, to 1s 9¾d per lb, duty paid, ex store; and that of the non-staining grades to 1s 10¾d.

Likewise, all grades of the company's 'Vistanex' polyisobutylene have been changed to 4s 6d per lb, in the same conditions. Prices apply to all quantities of either of the materials.

### DCL Alcohol Price Cuts

Industrial alcohol prices are to be reduced by the Chemical Division of the Distillers Co. Ltd., and the Methylated Co. Ltd. as from 4 January. Prices of methylated spirit are being reduced by amounts ranging from 4d per gall. for buyers in 2,500 gall. tanker loads to 1d per gall. for buyers in single 5-gall. drums. For plain British spirit the reduction is 2d per proof gall. for tanker loads and 1d per proof gall. for packaged delivery.

### Gas Detection Instruments

A new company, Willis Instruments Ltd., Field Road, Busby, Lanarkshire, has been formed in the West of Scotland to manufacture gas detecting instruments and alarms to certified and approved designs. They will also provide 24-hour servicing and maintenance facilities for all types of electrical and electronic scientific instruments. (See 'People', page 19).

### DCL Reduce Plasticisers Prices

Chemical Division of the Distillers Co. Ltd. have reduced their prices of two of the sebacate plasticisers as from 1 January. The reduction is approximately £3 per ton and typical new prices per ton for 10-ton lots delivered in road tankers are: Bisoflex DBS—£645; Bisoflex DOS—£626.

## DIARY DATES

**MONDAY 4 JANUARY**

**Inst. Works Managers**—Manchester: Chamber of Commerce, King St., 6.30 p.m. Open discussion on 'Management problems'. Chairman, Sir Alexander Fleck.

**S.C.I.**—London: 14 Belgrave Sq., S.W.1, 6 p.m. 'The improvement of refractories by incorporation of metals', by Drs. T. H. Blakeley and A. E. S. White.

**TUESDAY 5 JANUARY**

**S.C.I.**—London: 14 Belgrave Sq., S.W.1, 6.30 p.m. 'P.v.c. degradation and action of stabilisers' by Dr. E. C. A. Horner.

**THURSDAY 7 JANUARY**

**Polarographic Soc.**—Woking: 55 Oriental Rd., 7.30 p.m. 'Some problems in the polarography of sugars', by R. Motz.

**R.I.C.**—Manchester: College of Science and Technology, 2-8 p.m. Exhibition of chemical apparatus and techniques.

**FRIDAY 8 JANUARY**

**I.Chem.E.**—London: Burlington Hse., W.1, 5.30 p.m. 'Heat transfer to two-phase gas/liquid systems', by J. A. R. Bennett, J. G. Collier and H. R. C. Pratt; 'Pressure drop and hold-up in two-phase flow', by J. G. Collier, J. D. Thornton and J. A. R. Bennett.

**O.C.C.A.**—Manchester: Nag's Head Hotel, Jackson's Row, 6.30 p.m. 'Water-based industrial coatings', by E. S. J. Fry.

**R.I.C.**—Manchester: College of Science and Tech., 10 a.m.-8 p.m. Exhibition of chemical apparatus and techniques.

**S.A.C.**—Edinburgh: Royal Soc. of Edinburgh, 22 George St., 7.15 p.m. 'Infra-red spectroscopy', by L. J. Bellamy and Dr. D. M. W. Anderson.

**S.A.C. with R.I.C.**—Bristol: Meeting on 'Radiochemical analysis' and annual meeting, Western Group, S.A.C.

**Soc. Instrument Tech.**—Fowley: Administration Building, Esso Refinery, 5.30 p.m. 'Quality control', by D. Millership.

# NEW PATENTS

*By permission of the Controller, HM Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 3s 6d including postage; annual subscription £8 2s.*

*Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.*

## AMENDED SPECIFICATION

### On Sale 3 February

Sulphonate detergent preparation. California Research Corp. **698 620**

Carbonylation of olefins. Standard Oil Development Co. **717 446**

Recovery and re-utilisation of unreacted ammonia and carbon dioxide in urea synthesis. Toyo Koatau Industries Inc. **753 961**

Steroidal compounds. Searle & Co., G. D. **813 529**

### On Sale 10 February

Polyethylene terephthalate. Chemstrand Corp. **791 790**

Uranium alloys. Seybolt, A. U. **802 147**

## ACCEPTANCES

### Open to public inspection 3 February

Extraction of pyridine and its homologues from benzene containing solutions. Simon-Carves Ltd. **827 636**

Apparatus for burning waste materials. Klute P. [trading as Hirz Komm-Ges., E. L.]. **827808**

Low temperature separation of argon from air. Union Carbide Corp. **827 694**

Preparation of citraconic anhydride. Pfizer & Co. Inc., C. **827 638**

Recovery of ε-caprolactam from its polymerisate. Inventa AG. **827 703**

Purification of an alkali metal hypophosphite solution containing alkali metal phosphite. Fonte Electrique SA. **827 578**

Method of applying highly heat-resistant protective coatings to metallic surfaces. Mannesmann AG., and Metall-Gesellschaft AG. **827 824**

Iron recovery process. R-N Corp. **827 825**

Tantalum alloy. Sierra Metals Corp. **828 047**

Oxonation process. Esso Research & Engineering Co. **827 579**

Preparation of platinum-containing catalysts. Bataafsche Petroleum Maatschappij NV., De. **827 705**

Injectable tetracycline compositions. Bristol Laboratories Inc. **827 580**

Bleaching process, using aqueous solutions of chlorites. Deutsche Gold- und Silber-Scheideanstalt vorm Roessler. **828 049**

Installation for the vaporisation, under vacuum, of the volatile constituent of an alloy. Commissariat A l'Energie Atomique. **827 710**

Alkylation of aromatic hydrocarbons. Universal Oil Products Co. **827 830**

Dialysers. Technican Instruments Corporation. [Divided out of 827 924.] **827 925**

### Open to public inspection 17 February

Manufacture of explosive compositions. Taylor, G. W. C., and Napier, S. E. **828 148**

Manufacture of flash-sensitive explosive compositions. Taylor, G. W. C., and Napier, S. E. **828 149**

Production of calcium cyanamide. Ministry of Supply. **828 430**

Method of working expanded synthetic resin materials and articles made by the method. Agricola Reg. Trust. [Cognate application 16 623.] **828 154**

Manufacture of ceramic bodies composed of one or more oxides. General Electric Co. Ltd. **828 066**

Process for purifying polyolefins. Ziegler, K. **828 198**

Fertilisers. Scottish Agricultural Industries Ltd., Bookey, J. B., and Graham, R. **828 297**

Production of ferrites. Robinson, A. E., and Buckingham, J. **828 199**

Electrodeposition of metal coatings. Dehydag Deutsche Hydrierwerke GmbH. [Addition to 762 257.] **828 200**

Manufacture of polyethylene. Farbwerke Hoechst AG. **828 201**

Process for optical brightening of materials composed of polyester resins. Ciba Ltd. **828 545**

Manufacture of rosin size. Hercules Powder Co. **828 202**

Epoxylation products of unsaturated fatty acid amides and a process for their manufacture. Farbwerke Hoechst AG. **828 203**

Manufacture of vinyl pyridines and vinyl quinolines and their homologues. Farbenfabrik Wolfen Veb. **828 205**

Pellets for use in chemical processing apparatus and method of manufacture. American Viscose Corp. **828 206**

Production of succinic acids. Lonza Electric & Chemical Works Ltd. **828 441**

Borohydrides. Soc. Monsavon-L'Oreal. **828 208**

Cyclopentanophenanthrene derivatives and processes for the production thereof. Laboratoires Francais de Chimiotherapie. **828 601**

Apparatus for delivering sterile water. Procedes Industriels et Charbons Actifs. **828 446**

Vulcanisable composition. National Research Council. **828 447**

Fat composition. Zilversmit, D. B. **828 312**

Manufacture of terephthalic acid. British Celanese Ltd. **828 313**

Low-temperature polymerisation of iso-olefins. Polymer Corp. Ltd. **828 536 & 828 537**

Stabilisation of polymerised ethylenically unsaturated materials. Dow Chemical Co. **828 320**

Device for spraying liquids by means of a volatile propellant. Galeazzi, F. **828 160**

Polymerisation process. Imperial Chemical Industries Ltd. **828 326**

Processes for reclaiming vulcanised natural and/or synthetic rubber and for producing reaction products therefrom. U.S. Rubber Reclaiming Co. Inc. **828 162**

Method of vulcanising polymeric materials and product thereof. Phillips Petroleum Co. **828 328**

Insecticidal compounds and their use. Geigy, AG. J. R. **828 231**

Method of forming films of chromium oxide. Libbey-Owens-Ford Glass Co. **828 338**

Method for producing titanium, zirconium, cerium, hafnium or thorium. Barium Steel Corporation. **828 238**

Method for refining and separating a metal selected from the group consisting of titanium, zirconium, cerium, hafnium and thorium. Barium Steel Corp. **828 239**

Descaling titanium and titanium base alloys. Imperial Chemical Industries Ltd., Davis, H. R., and Dyer, P. A. M. **828 225**

Veterinary compositions containing acid hydrazides. Imperial Chemical Industries Ltd. **828 344**

Process of stabilising and bleaching cellulose ester fabrics. Celanese Corp. of America. **828 096**

Production of alginate jellies and the like. Alginate Industries Ltd. **828 350**

Stilbene azo dyestuffs. Imperial Chemical Industries Ltd. **828 353**

Preparation of crystalline polypropylenes. Union Chimique Belge S.A. **828 634**

High-vacuum A.C. arc melting of reactive metals. Union Carbide Corp. **828 245**

Thiophosphoric acid esters and their production. Farbenfabriken Bayer AG. **828 636**

Device for vaporising liquids. Metaalindustrie Post & Eger (P. & E.) N.V. **828 359**

Converting liquid hydrocarbons into gases consisting substantially of lower molecular weight carbon compounds. Gerhold, M. **828 639**

Apparatus for concentrating and feeding a liquid slurry of polymeric particles to a screw extruder. Du Pont de Nemours & Co., E. I. **828 361**

Method for repairing glass-coated apparatus. Pfaudler Co. **828 254**

Preparation of ethers of epoxy-substituted phenols and the resulting ethers and their polymers. Bataafsche Petroleum Maatschappij N.V. **828 364**

Preparation of metallic uranium from uranium tetrachloride by fused salt electrolysis. Japan, Ministry of International Trade & Industry. **828 258**

Polymerisation of bicyclo (2, 2, 1)-2-heptene. Du Pont de Nemours & Co., E. I. **828 563**

Fire extinguisher containing a powdered fire-extinguishing composition. Chemische Fabrik Grünau AG. [Addition to 760,510.] **828 366**

Production of polymers and copolymers of isobutylene. Badische Anilin- & Soda-Fabrik. **828 367**

Therapeutic compositions. Pfizer & Co. Inc., C. **828 369**

Alkyl 3-alkoxypropionates. Distillers Co. Ltd. [Cognate application 29 462.] **828 371**

Manufacture of polyamides. Imperial Chemical Industries, Ltd., Baker, P. A., and Costain, W. **828 264**

Manufacture of titanium. Imperial Chemical Industries Ltd. **828 374**

Dehydrogenation of organic compounds and catalyst therefor. Phillips Petroleum Co. **828 378**

Manufacture of reinforced synthetic resin articles. Polyplex Danish-American Plastics Co. A.S. **828 110**

Process for chlorination of olefin polymers. Du Pont de Nemours & Co., E. I. **828 379**

Preparation of polycarbonates. Columbia-Southern Chemical Corp. **828 523 & 828 524**

Production of 2-(β-amino-ethyl)-indole. Geigy, AG, J. R. **828 521**

Purine derivatives and a process for the preparation thereof. Geigy AG, J. R. **828 522**

Permselective membranes, process of producing them, and applications of these membranes. South African Council for Scientific & Industrial Research. **828 382**

Acrylates of phenoxy alcoholethers and polymers thereof. British Resin Products Ltd. **828 496**

Process and apparatus for upgrading of tars and pitches. Koppers Co. Inc. **828 116**

Device for feeding pulverulent material, especially dolomite. Sorensen, R. **828 384**

Producing halogenated copolymers. Esso Research & Engineering Co. **828 389**

Apparatus responsive to the composition of a gaseous medium. Detection Electronique Francaise D.E.F. **828 121**

Diazotype materials containing coupling components for high opacity ultraviolet yellows and visually dense sepias. General Aniline & Film Corp. **828 390**

Removal of benzene and its homologues from an absorbent liquid. Koppers Co., Inc. **828 391**

Phenthiazine derivatives and processes for their preparation. Soc. Des Usines Chimiques Rhone-Poulenc. [Addition to 805 886.] **828 393**

Cyclopentanophenanthrene derivatives and process for the production thereof. Laboratoires Francais de Chimiotherapie. [Divided out of 828 601.] **828 602**

Process for the production of cyclopentanophenanthrene derivatives. Laboratoires Francais de Chimiotherapie. [Divided out of 828 601.] **828 603**

Triarylmethane dyes. Caribonum Ltd. **828 394**

Manufacture of tetrahydrofurfuryl-ammonium compounds. Hoffmann-La Roche & Co. AG., F. **828 395**

Controlled availability fertiliser compositions. Esso Research & Engineering Co. **828 400**

Propellant powders. Olin Mathieson Chemical Corp. **828 401**

Process for preparing divalent or trivalent metallic salts for glucuronic acid. Chugai Seiyaku Kabushiki Kaisha. **828 404**

Bicyclic compounds and a process for the manufacture thereof. Hoffmann-La Roche & Co. A.G., F. **828 591**

Process for agglomerating iron concentrates. R-N. Corp. **828 412**

Aqueous microcrystalline insecticidal dispersions. Imperial Chemical Industries of Australia & New Zealand Ltd. [Addition to 783 848.] **828 414**

Preparation of concentrated acetoacetamide solutions. Lonza Electric & Chemical Works Ltd. **828 423**

## Flame-Retardant Building Materials

A publication entitled 'Flame-retardant building materials' has just been published by H.M.S.O. for the Department of Scientific and Industrial Research, listing proprietary products which have achieved the highest classification in appropriate tests (the surface spread of flame test of B.S. 476). It is available from H.M.S.O. at 1s; 2d extra by post.

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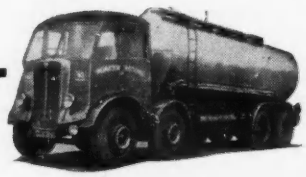

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